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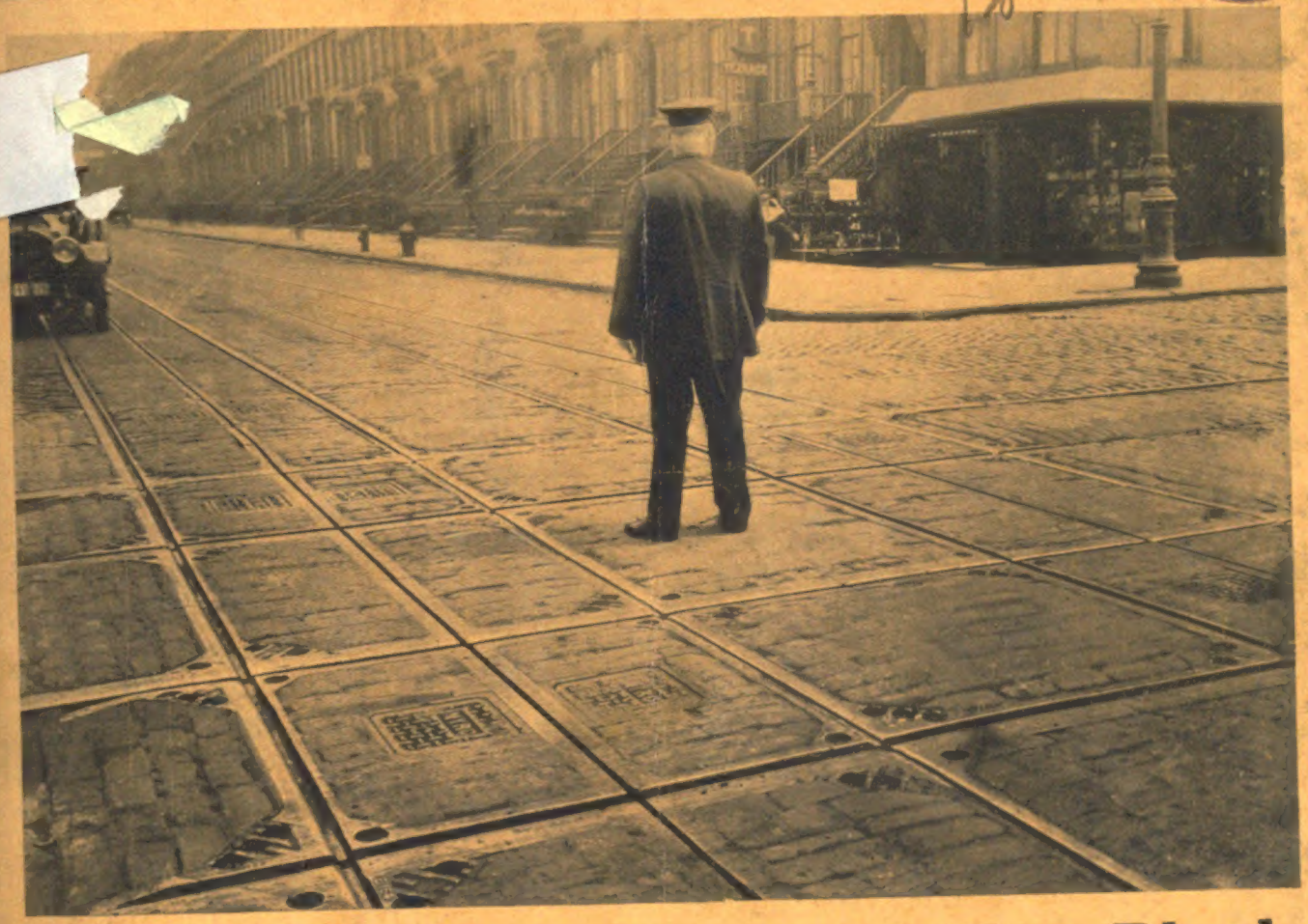

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Company, Inc., May 4, 1918

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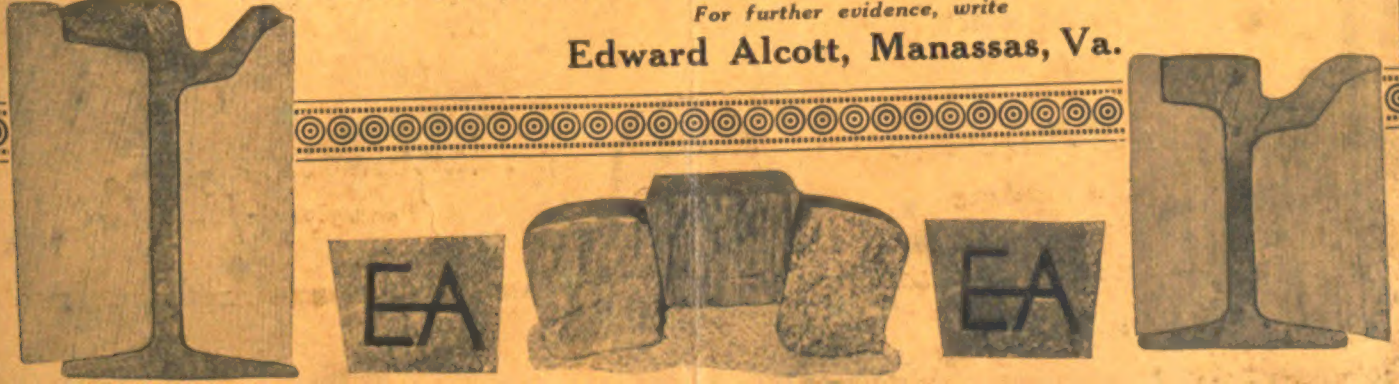
The Alcott Rail Filler and Key Block

At 10th Avenue and 23d Street New York City

THE above special work receives the crosstown car traffic which is heavy as well as the heavy traffic of the New York Central trains. This proves that the Alcott Rail Filler and Key Block has no equal in holding tight such difficult places as above shown in addition to prolonging the life of special work at least five years.

For further evidence, write

Edward Alcott, Manassas, Va.





Realization

"THE Board unanimously approved the appropriations you requested," said the President to the General Manager, "and I have assured them that, by installing this dipping and baking outfit for armature and field coils, we will not only eliminate most of the motor troubles we had last winter, but will also greatly reduce the maintenance cost."

"The saving in maintenance cost will, of course, be offset somewhat this year by the cost of these new facilities," answered the General Manager, "but you must bear in mind the great value of giving more reliable service which better maintenance insures."

The president broke in and stated, "Well, it's up to you now to give Joe, the superintendent, what he wants, and we will see next winter whether Joe knows what he is talking about or not."

Westinghouse Electric & Manufacturing Co.
East Pittsburgh Pennsylvania

Vol. 51, No. 18 New York, May 4, 1918 Pages 839 to 888

Electric Railway Journal

H. W. BLAKE, *Editor*

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Detailed Report on Traffic Conditions in Pittsburgh

City's sharp changes in grade and the natural barriers around its business district makes transportation problems difficult. Traffic and industrial surveys help to suggest remedies. Elevated and subway line proposed...Page 842

Skip Stop at Washington Effects Service Increase

Co-operation of public, commission and railways leads to immediate success of skip-stop plan. Elimination of more than one-third of stops, use of vivid stop signs, erection of loading platforms and front-end fare collection increases schedule speeds materially.....Page 848

How the Electric Railways Can Help to Build Ships

Passenger transportation service section of United States Shipping Board has begun co-operating with electric railways to provide real transportation facilities quickly. Double-tracking, train operation, prepayment areas and staggered hours show progressive spirit and foresight.....Page 853

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Working and Fighting Must Go Hand in Hand.
Put All War Transportation and Housing Under One Head.
Union Leaders Should Translate Words Into Deeds.
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McGRAW-HILL COMPANY, INC., 10th Avenue, at 36th Street, NEW YORK

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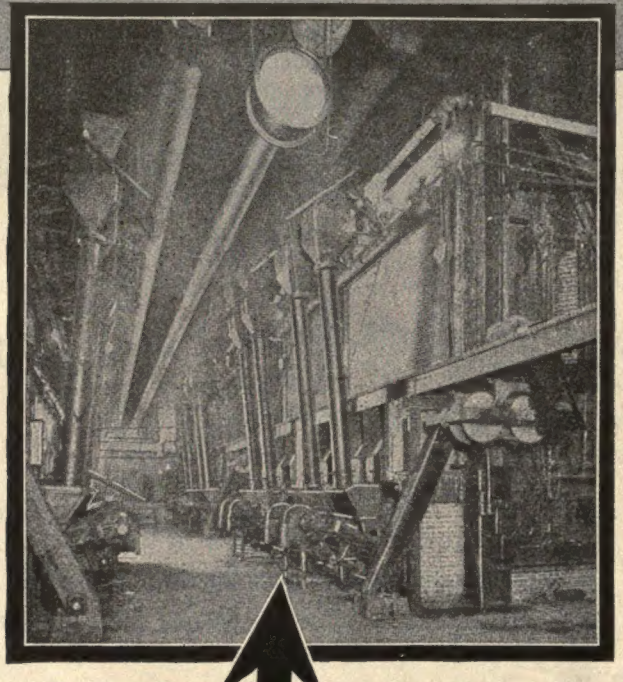
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Circulation of this issue 7150 copies

Advertising Indexes—Alphabetical, 80; Classified, 74, 76, 78; Searchlight Section, 70, 71, 72, 73

Westinghouse

Burning Low Grade Illinois Coal Successfully



John Hunter, Chief Engineer of the Union Electric Light & Power Co., St. Louis, Mo., says—

"Heretofore there was little encouragement from any source outside of the manufacturer that successful operation could be obtained with this coal (Low Grade Illinois) on this equipment.

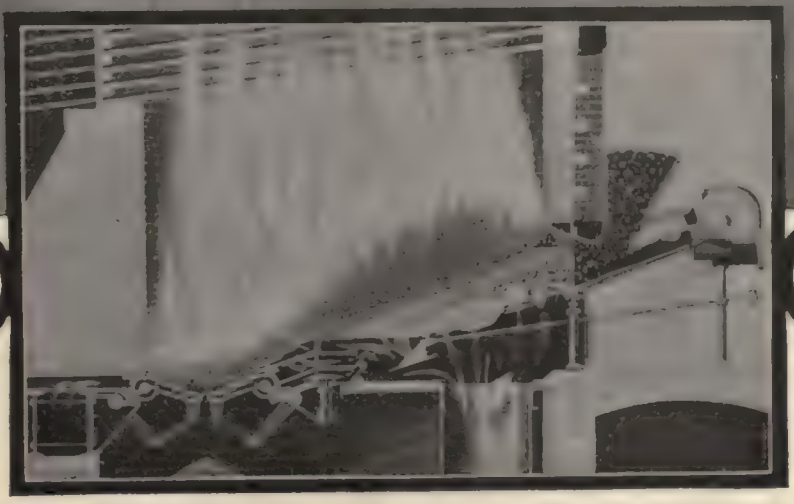
"However, after six months' operation, the success of the venture has been proved beyond a doubt.

"Boiler ratings up to 200% are being carried continuously, with an overall boiler efficiency of 74.5% --this as opposed to approximately 65%, which was the maximum efficiency obtainable with our former stoker equipment."

WESTINGHOUSE ELECTRIC & MANUFACTURING CO.
East Pittsburgh, Pa.

Westinghouse

Overall Plant Efficiency Raised From 65 to 74.5%



The Westinghouse Underfeed Stoker

—will burn satisfactorily—a wide variety of fuels—ranging from high-volatile Eastern to high-ash Western Coals and Lignite.

The selection of the Westinghouse Underfeed Stoker, which will burn many fuels satisfactorily, *is a precaution of inestimable value to-day.*

Are you prepared for the emergency?

The Greatest Mother in the World



Red Cross contributions, frequent and generous, are our bounden duty. They insure to us here in our comfortable homes a security dearly bought by our soldiers, battered, bruised and bleeding, over there in the battle-torn lines of the World's greatest fight for civilization, home and family. Therefore, we must give, give and give again—give on every call. It's for him and the "Greatest Mother in the World."

Westinghouse Air Brake Co.

General Office and Works, Wilmerding, Pa.

Atlanta, Ga.
Boston, Mass.
Chicago, Ill.
Columbus, O
Denver, Col.
Houston, Tex.
Los Angeles Cal.
Mexico City
New York, N. Y.
Pittsburgh, Pa.
San Francisco.
Seattle, Wash.
St. Louis, Mo.
St. Paul, Minn.



154 Safety Cars in Sixty Days

Stone & Webster properties bought 154 Birney Safety Cars within 60 days, to be shipped to Tacoma—Seattle—Tampa and Ft. Worth.

Why did this widely and favorably known managing company select Safety Cars?

Because investigation showed that Safety Cars, operating in a certain large city where conditions were unfavorable, resulted in a saving of $6,000 a year over the operating cost of heavy double-truck cars, while at the same time giving a

33% Increase In Service

Let Us Explain

SAFETY CAR DEVICES CO.

Main Office—Boatmen's Bank Bldg., ST. LOUIS

CHICAGO
Ry. Exch. Bldg.

NEW YORK
City Invest. Bldg.

PITTSBURGH
Westinghouse Bldg.

CANADA—Canadian Westinghouse Co., Ltd., Hamilton, Ont.

POLES that Last a Life-time



This handsome line installation for combination trolley and light service has been in use at

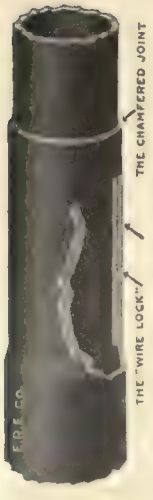
South Bend, Ind.,

for many years and is today in as good condition as when erected.

The utility of the tubular steel pole is so obvious that arguments are a clear waste of words.

We are making 2- and 3-service tubular poles to meet any requirements. They all have the "wire lock" swedge joint, which prevents telescoping under the heaviest strains, and the chamfered joint, which absolutely prevents rust.

Ask us about these poles.



ELRECO Tubular Poles Combine

Lowest Cost

Lightest Weight

Least Maintenance

Greatest Adaptability

ELECTRIC RAILWAY EQUIPMENT CO.

Cincinnati, Ohio

New York: 30 Church Street

O-B PRODUCTS



SANELY BALANCED EXCELLENCE

Dirigo Insulation is good in every direction.

Mechanically it has plenty of strength for heavy strain.

Electrically it has a generous margin of safety over the usual service requirements.

Bad weather and extreme temperatures have no terrors for Dirigo.

All of these qualities are blended, balanced—each has received the proper degree of emphasis.

So on the line Dirigo gives unusually good service.

Dirigo is an exclusive O-B product, developed during more than a score of years. Used in all O-B Trolley Hangers and Composition Strains.

Catalog No. 16 and Supplement No. 1.

THE OHIO BRASS COMPANY, Mansfield, Ohio

New York Philadelphia Pittsburgh Chicago Los Angeles San Francisco

Phono-Electric

In front of Home of the Virginia Railway and Power Company



The Richmond installation of Phono-Electric Trolley Wire is on Seventh Street, near the handsome office building of the Virginia Railway & Power Company.

From this building the officials of this company have ample opportunity to see how Phono-Electric Trolley Wire stands up in service year after year.

Phono-Electric can stand inspection!

Bridgeport Brass Company
Bridgeport Connecticut

2083

How to SAVE $4300 per Mile

Wooden Ties [*Per 100 Feet of Track*]		Int. Steel Ties	
20 tie rods	$17.00	16⅔ steel twin ties	$116.66
50 ties	42.50	134 cast malleable clips	10.72
100 tie plates	45.00	15 cu.yd. concrete	87.75
100 lb. spikes	4.00	15.2 cu.yd. excavation	19.00
28.3 cu.yd. concrete	165.56		
34 cu.yd. excavation	42.50		
Total	$316.56	Total	$243.13

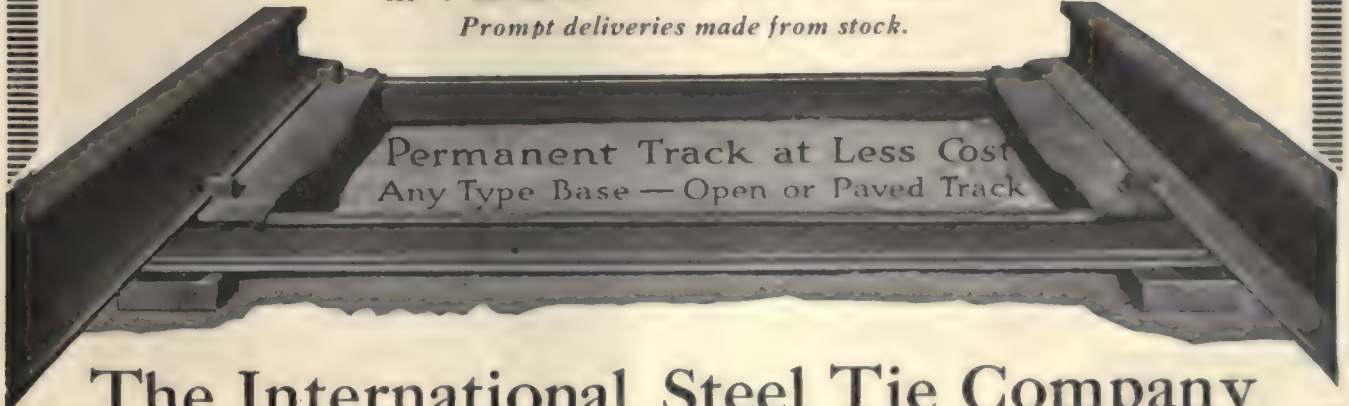
Saved per 100 feet..... $82.43
Saved per Mile of track.. 4352.30

And Besides: No tie rods; no tie plates; no cross bonds; narrow trench (7 ft. instead of 9 ft.); 50% labor saved in track construction below base of rail. Concrete foundations bear up well under heaviest traffic.

Ask us for proofs

INTERNATIONAL
STEEL TWIN TIES

Prompt deliveries made from stock.



The International Steel Tie Company

Manufacturers of Steel Twin Ties and Crossing Foundations

General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

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These Raceways Do Not Pit Nor Wear

This is one of the chief points of superiority in the Hartman centering center plate. The large diameter balls, 2⅛ inches, carry the load over such an area of the raceway that pitting and wearing is prevented.

Thus a line contact is provided instead of a point. And these balls do not wear and will not crush.

This statement is proven by over 200,000 Hartman bearings in service on electric and steam railway cars. 72% of our monthly orders come from electric railways for installation on additional cars after test on partial equipment.

Holden & White Inc.

Electric Railway Distributors for The Joliet Railway Supply Company

1508 Fisher Bldg., Chicago

National Rwy. Appliance Co., New York, Washington; Grayson Rwy. Supply Co., St. Louis; W. M. McClintock, St. Paul; Alfred Connor, Denver; C. E. A. Carr, Toronto; F. F. Bodler, San Francisco; S. I. Wailes, Los Angeles; W. F. McKenney, Portland; O. H. Davidson Equip. Co., Salt Lake City.



See Page 11

of our Perry Hartman Bearing catalog for complete description of this device and how it can be applied to OLD CARS. Copy free on request.

Hartman Centering Center Plate



Here's where your Keystone Steel Gear Cases are made



Typical Keystone Steel Gear Case

It is here that Keystone Steel Gear Cases are formed, riveted and spot-welded; being made from the best open-hearth steel we can buy.

It is here that they are built to perform their service under extreme conditions—each of millions of vibrations each day, and some severe ones; bad knocks from roadbed obstructions, and the continual wrenching of the trucks, all must be unfailingly and indefinitely resisted by the gear case.

There is no gear case that will better meet these extreme difficulties than the light-weight Keystone Steel Gear Case. This has been proved on hundreds of representative railways.

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Winnipeg.



The Labor Problem Won't Stop You Killing Weeds *Chemically*

We take full charge and clean your tracks with one application in a single operation.

The old method that takes weeks and even months is replaced by the modern ATLAS "A" method—which consists of personal supervision over our own sprinkling equipment which treats from 15 to 50 miles a day.

Not only does ATLAS "A" eliminate the shortage of labor problem, but its cost is much less than the hand weeding method, even in its first year. And, too, it builds cumulative results—the second year costing 40-50% less than the first. This means still greater economy each succeeding year. The final outcome is practically permanently clean tracks.

The Weed Season is now on us as well as transportation difficulties. These conditions call for your immediate consideration of this subject.

Write us the number of miles you wish to have freed from weeds and we will send you a detailed estimate covering all costs.

Chipman Chemical Engineering Co., Inc.

95 Liberty St., New York



Before Treatment

Atlas "A"



After Treatment



PROVIDENCE TO BUTTONWOOD - GRANT TO ROCKY POINT PARK

Traffic on the Rhode Island Co. Lines between the above mentioned points is protected by Union Model 15 Light Signals, controlled by A. C. track circuits and galvanometer relays.

At times during the Base Ball and Picnic season cars are operated on less than one minute headway. Blocks are approximately 750 feet long.

The Union Switch & Signal Co.

Founded by Geo. Westinghouse 1881.

SWISSVALE, PA.

Trade Mark

Hudson Terminal Bldg. NEW YORK
Peoples Gas Bldg. CHICAGO
Canadian Express Bldg. MONTREAL
Candler Annex ATLANTA
Railway Exchange Bldg. ST. LOUIS MO.
Pacific Bldg. SAN FRANCISCO

Represented by the GENERAL ELECTRIC CO. in Australasia, South Africa and Argentine

Trade Mark



The Signal They All See

The CHAPMAN AUTOMATIC SIGNAL shown in this photograph is one of the signals which forms part of the equipment of a thoroughly up-to-the-minute New York interurban electric railway company.

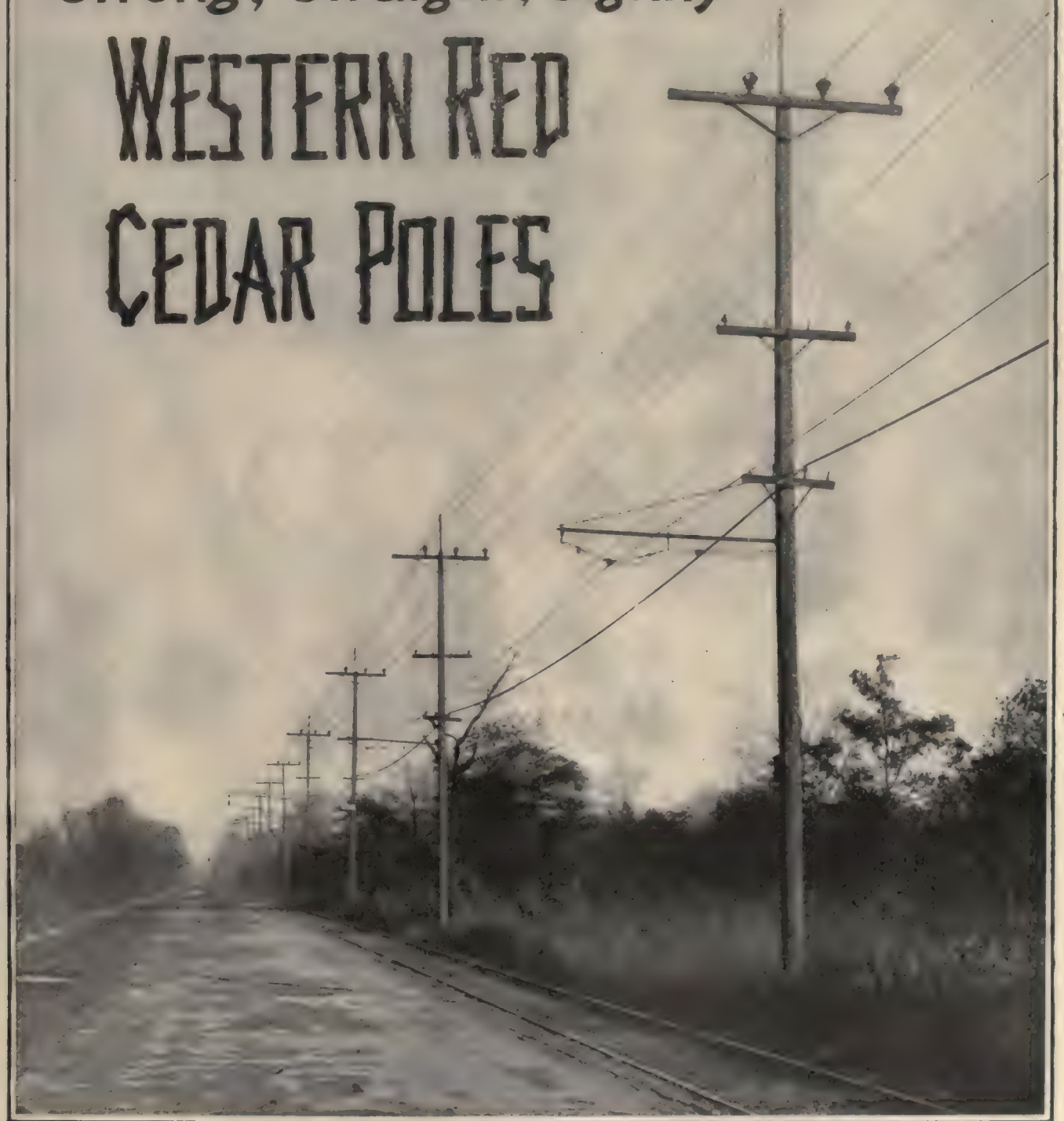
The extremely satisfactory operation of this system, the speeding up of the movement of cars and the effective insurance against accidents make the CHAPMAN AUTOMATIC SIGNAL SYSTEM a mighty valuable improvement to the road. The signals are positive, can be read at any time of day or night in all weather, are very economical to maintain and every part is easily accessible. The excellent material and good workmanship denote long life and constant operation.

Full details of this practical system should be in the hands of every railway official. Write for information.

Charles N. Wood Co., 14 Federal St. Boston, Mass.

They Make The Beautiful Line Strong, Straight, Sightly

WESTERN RED CEDAR POLES

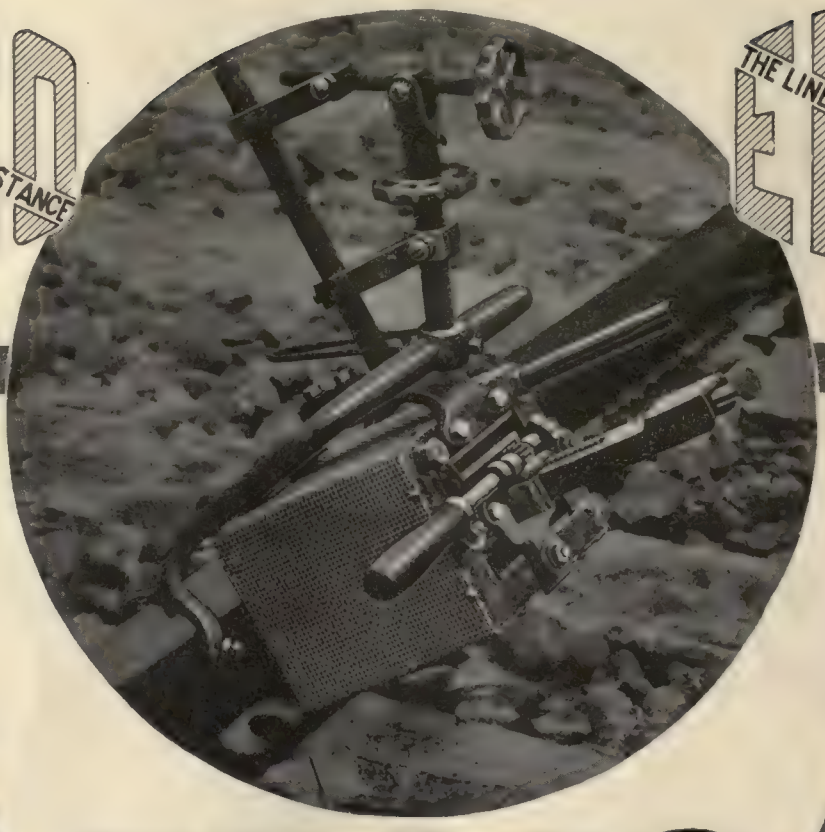


Lines of the Gary Street Railway Company on 11th Ave., Gary, Ind. Built of 50 ft. Western Red Cedar Poles; set in 1913.

1—3/16-in. Copper Clad Stranded Static Wire.
3—1/0 Stranded 33,000-Volt High Tension Wires.
2—No. 6 Arc Circuits of the Gary Heat, Light & Water Co.
2—No. 10 Telephone Wires.
1—500,000 M.C. Stranded Feeder Wire.
1—1/0 Trolley.

Western Red Cedar Association, Spokane, Washington

ERICO THE LINE OF LEAST RESISTANCE



ERICO THE LINE OF LEAST RESISTANCE

ERICO

Portable Welders

have now *made good*. Tested and tried in two years of actual service they have met all expectations.

Because of its easy removal and transport, the Erico Portable Welder is shown to be an efficient working unit and permits applications where larger equipment would be impracticable or impossible.

The Welder Portion shown in the photograph weighs but 65 pounds complete with mountings. It is easily handled by *one* man. No flame or arc strikes either the rail or the *bond*.

The Electric Railway Improvement Co.

Cleveland, Ohio



The Abbott Rail-Joint Plate "Built like a bridge"

THE Abbott Plate supports the wheel load and transmits it to the two joint ties as completely and in the same manner as a short deck bridge puts load upon its piers. In other words, the splice bars are practically relieved of other duty than overcoming lateral thrust and maintaining lateral alignment, while the Abbott Plate *unfailingly* holds the track surface up to the right level for smooth running.

This reinforcement against vertical thrust eliminates the worst cause of worn, bent and broken bars, stretched bolts, loosened nuts and battered rail ends, and adds greatly to safety.

Other features of the Abbott Plate, too numerous to mention here, make the installation pay for itself the first year and provide otherwise unobtainable benefits. You can't be well posted on track safety and economy until thoroughly familiar with the facts. Ask us for figures and proof.

Ask for our booklet "Improved Track Appliances."

Lackawanna Steel Company
LACKAWANNA, N. Y.



ATLANTA CINCINNATI
BOSTON CLEVELAND
BUFFALO DETROIT
CHICAGO NEW YORK
PHILADELPHIA SAN FRANCISCO
ST. LOUIS HAVANA



What Happens to a Rolled Rail Crossing



Joints in Balkwill Articulated Cast Manganese Crossings are life savers. They positively prevent breakage at flangeway intersections, permitting 100% wear before renewal

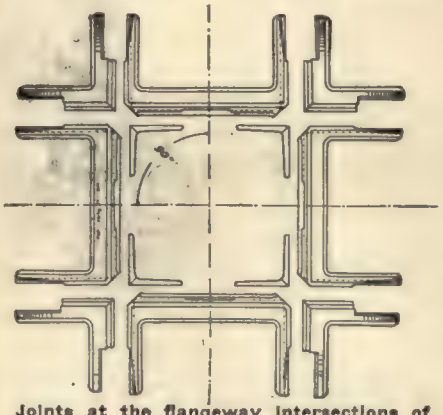
Why Balkwill Articulated Cast Manganese Crossings Are Superior to Rolled Rail Crossings

This picture at the left shows where breaks in the main steel filling or backbone of rolled rail crossings are usually found.

These breaks are unavoidable because of the lack of flexibility of the rolled steel filler at the flangeway intersection.

In the Balkwill Articulated Cast Manganese Crossing the difficulty is corrected by placing scientifically designed joints at the very places where breakage formerly occurred.

The lower first cost of a rolled rail crossing is therefore not a lower overall cost because it takes several rolled rail crossings to equal the life of one Balkwill Articulated Cast Manganese Crossing. Therefore the Balkwill Crossing is the cheapest in the long run. It gives



Joints at the flangeway intersections of Balkwill Articulated Cast Manganese Crossings positively eliminate breakage

MORE WEAR PER DOLLAR THAN ANY OTHER CROSSING YOU CAN BUY

It saves interruptions to traffic, makes less demand on labor, which is now so scarce, and also reduces the cost of making replacements frequently.

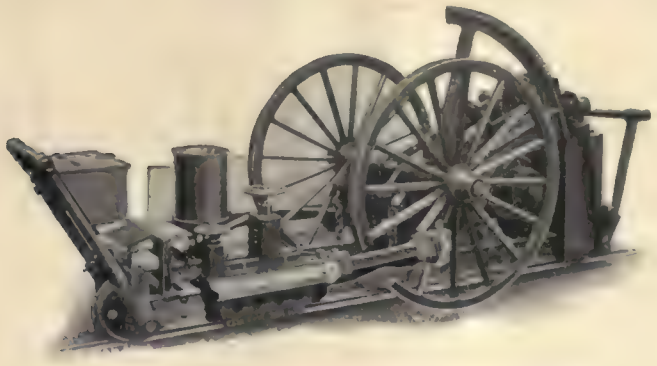
Write us for data on existing installations. If your special work manufacturer cannot get prompt deliveries of manganese castings or has not taken out a license to manufacture these crossings, DON'T ACCEPT A SUBSTITUTE but write us direct and we will see that your requirements are taken care of.

Order Balkwill Articulated Cast Manganese Crossings Direct from Your Special Work Manufacturers

The Balkwill Manganese Crossing Co.

506 Williamson Building, Cleveland, Ohio

$40,000 in One Instance—
$20,000 in Another



These sums represent the savings achieved in two instances by two different electric railway companies who used

Reciprocating Track Grinders

to restore a bad piece of track. In each instance it looked at first as if the only remedy for the condition was to lay new track.

But in both cases thoroughly satisfactory results were obtained without the heavy expenditure necessary for reconstruction.

The Reciprocating Grinder made this possible and produced a satisfactory solution of the problem as well as big savings.

These are just two cases from the experience of nearly a hundred companies which have bought and are using one or more Reciprocating Grinders.

The two cases cited are typical of the kind of savings made by railways throughout the country by using Reciprocating Grinders.

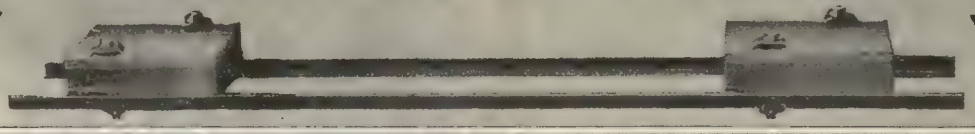
Not all companies utilizing Reciprocating Grinders have made as large savings from the use of these machines as the two companies mentioned above, but every single purchaser has found the machine a thoroughly good investment.

Railway Track-work Company

30th and Walnut Streets, Philadelphia

AGENTS: Holden & White, Inc., 343 S. Dearborn St., Chicago.
Wigmore, Hall & Co., Pacific Electric Bldg., Los Angeles, Cal.

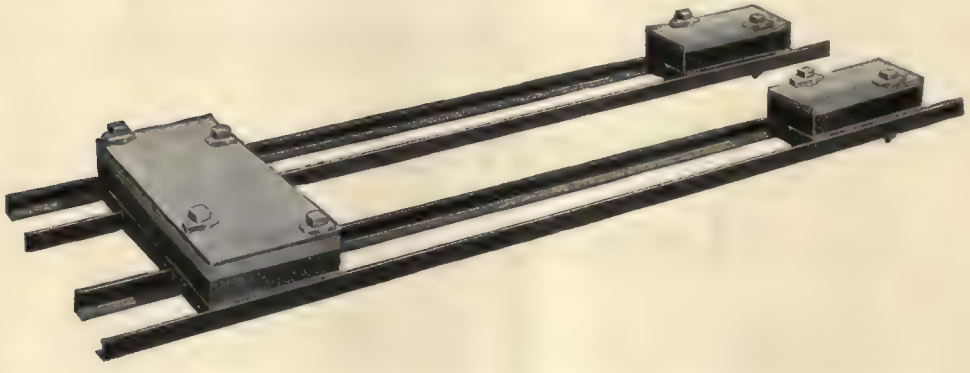
The MECHANICAL RAILWAY TIE



Where Rails Join

This is the point in the track that fails first. With ordinary ties, even the loosening of a fish plate will start the joint to knocking.

Here is a sure method of making the tie bind the rail ends permanently to both surface and alignment.



The Dayton Mechanical **Joint Tie** shown in this illustration is our answer to the "loose joint" problem. One tie block with the added security of a steel plate carries the ends of both rails. The cushion feature is here also.

It is absolutely impossible for one of the rail ends to sink even the smallest fraction of an inch below the level of the other end on the same block.

Absolutely perfect surface and alignment is the result with all the attending advantages of freedom from shocks to rolling stock, decreased noise and economy of maintenance.

THE DAYTON MECHANICAL TIE CO.
201 Third Street Arcade
DAYTON, OHIO

FACE THE LABOR SHORTAGE

MEN—even if you can get them—cannot be spared now to shovel coal and push wheelbarrows.

With the right equipment you can move all your coal and ashes by machinery and save half your present handling costs besides.

We do not merely sell coal and ash handling machinery—we design and erect the complete equipment. We study your special conditions, plan to meet them and send expert erectors to install the job ready to operate.

One contract covers everything. You take no chances with contractors unfamiliar with the work and there is no divided responsibility.

The scarcity of fuel has compelled many concerns to remodel their old boiler houses and plan on additional coal storage. We are solving over 50 such problems every month and can handle a reasonable number more.

Remember last winter and don't wait until mid-summer or fail to act.

Send sketches of your boiler room layout—we'll tell you what can be done and how much it will cost.

Catalog 33 tells more about our service.

R. H. BEAUMONT COMPANY

111 South Fifth Street, Philadelphia, Pa.

New York: 50 Church St. **Boston: 141 Milk St.**

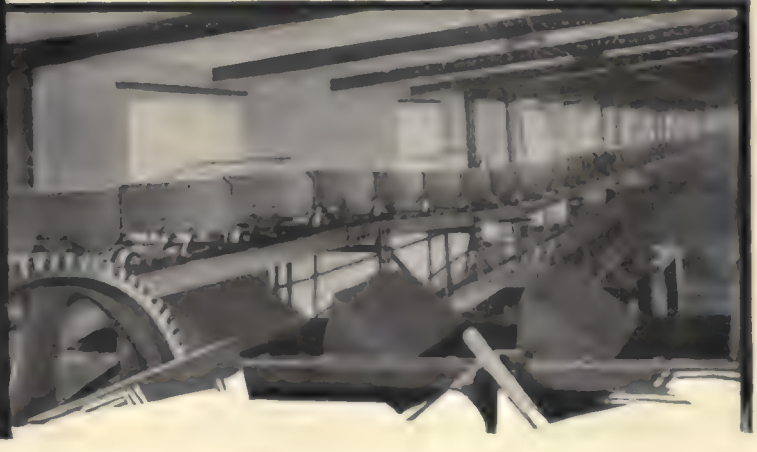
Specialists for 25 years in complete equipment for handling coal, ashes and coke in boiler and gas houses.

Illustrations show V-bucket elevator and flight conveyor; also bunker installed by us in boiler room of Worth Bros.



Beaumont

ONE CONTRACT
ONE RESPONSIBILITY





Do Not Waste Man Power and Money!

The Government needs men at the front, on farms and in factories.

BONHAM TRAFFIC RECORDERS perform the clerical work, reduce platform expense and save coal.

Release the man-power for war work.

Save the coal and buy thrift stamps.

The Bonham Recorder Company

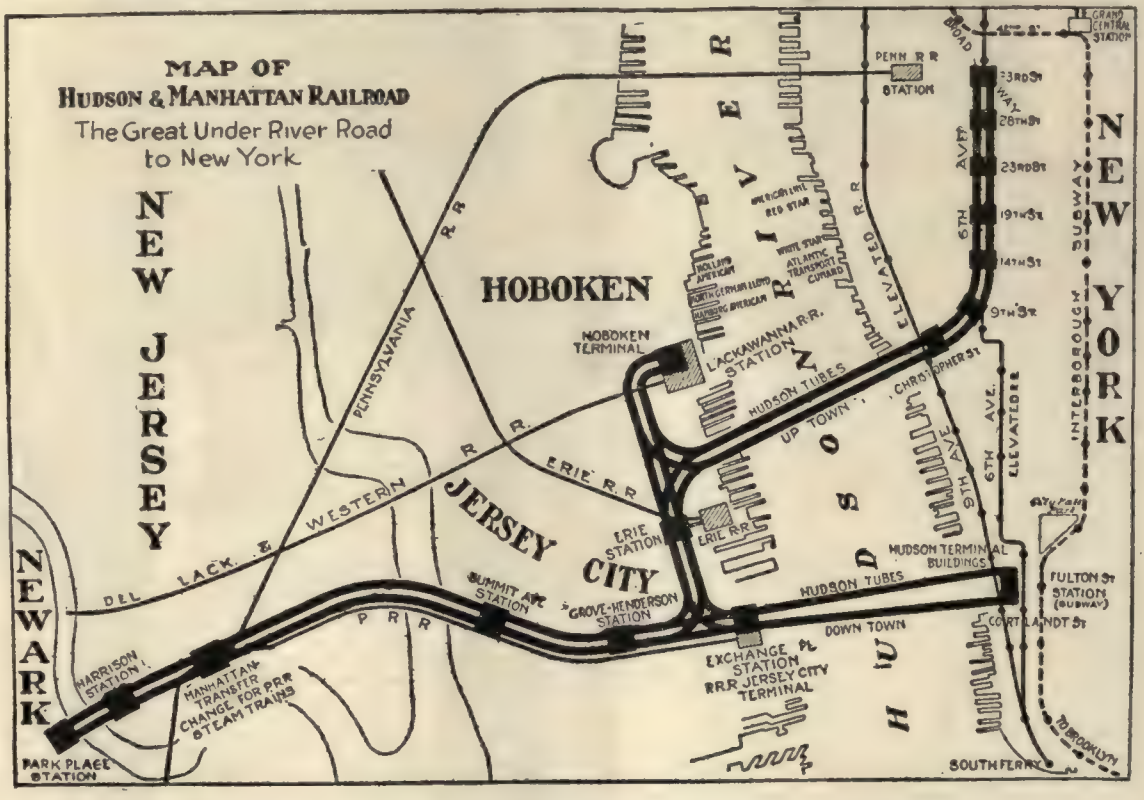
HAMILTON, OHIO


I am—
"The Watchdog of Your Power!"
My duty is to guide and to guard.
To lay bare waste; to foster economy.
To show the motorman the most efficient way of drawing on that costly supply of electrical energy subject to his slightest touch.
To point out to him, through friendly instruction, the substantial savings in energy which he can effect by the correct use of controller and brake.
I work for the management that installs me.
I work for the motorman on whose car I operate.
I play fair with both.
I produce results in the simplest, most direct way.
I meter the energy because that's what you want to save.
I am always on the job.
I ask no favors — I pay my way.
I'll save you 10 to 15 per cent. in power.
I am—
the
ECONOMY Meter
0 2 8 8
KILOWATT HOURS
ECONOMY ELECTRIC RAILWAY METER
SANGAMO ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS
VOLTS 550 AMPS. 200
WATTHOURS PER DISK REVOLUTION
MFD. EXCLUSIVELY FOR
ECONOMY ELECTRIC DEVICES CO.
CHICAGO

Around the Continent on Hale *and* Kilburn Seats

New York—Newark

New York Municipal—Interborough Rapid Transit—Hudson & Manhattan



In beginning a form of inspection of Hale and Kilburn Seating installations we can begin appropriately enough with the three great subway systems of New York for all of them have standardized on

Hale and Kilburn Seats

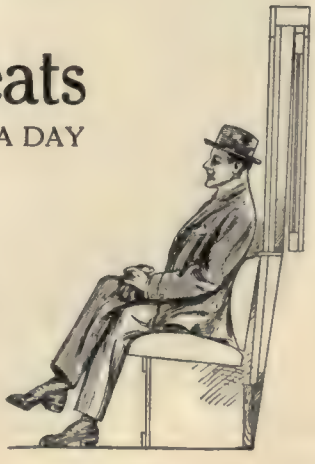
NOW CARRYING OVER 2,000,000 SUBWAY RIDERS A DAY

Of these installations the 20-mile Hudson & Manhattan Railroad, although the smallest is decidedly interesting for its adoption some ten years ago of Hale and Kilburn's

Correct Posture Longitudinal Seating

Experience has proved not only the correctness and comfort of this design, but also its durability and shape-retaining features on a railroad which in 1917 carried 8,442,020 passengers per mile of road and 317,509 passengers per car.

Correct design, flawless materials and honest workmanship make an unbeatable combination.



Hale and Kilburn Corp.

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National Pneumatic

Door and Step Control

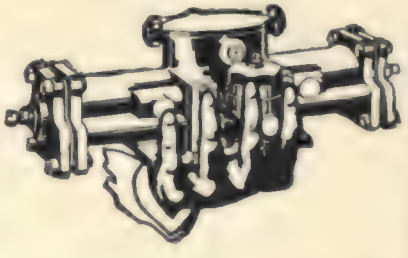
At Cleveland

This picture shows that the Cleveland Railway uses its very latest car—the Peter Witt front entrance, center-exit type—in the intensive service on the short stretch between the Public Square and the steamer piers.

This line is particularly busy in summer when many of the passengers are encumbered with traveling bags and suit-cases.

The speedy loading and unloading natural to this design of car is accelerated by the use of

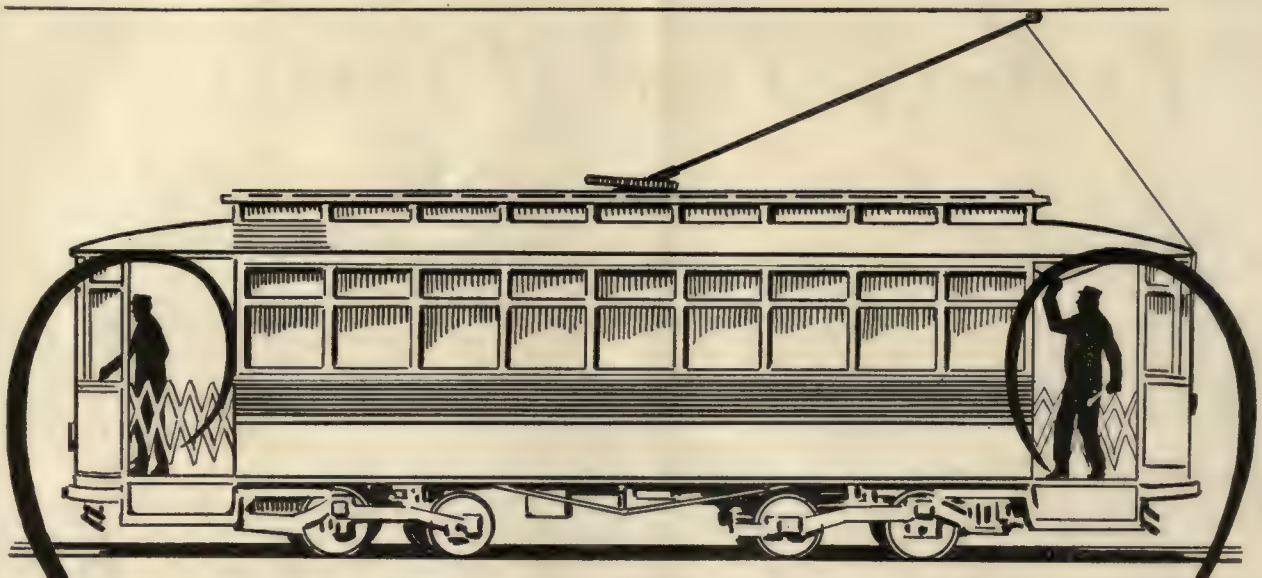
National Pneumatic Door and Step Control.



NATIONAL PNEUMATIC COMPANY INC.

50 Church St. New York

515 Laflin St. Chicago



The Size of Your Coal Bill Depends Largely on These Men

Cutting out waste of power by improving boiler-room and power-plant methods and equipment is fine—and saves money.

Cutting out waste of power by skillful designing of cars to eliminate excess weight is also essential—and saves money.

But you are never going to reduce your power cost to the minimum for a given service until you cut out the waste at the point of use—*on the car.*

When your motormen continuously operate cars over a given run on a given schedule with the least possible amount of power necessary to maintain that schedule then—and not until then—will you have eliminated the chief waste of power.

And the motorman cannot get the *best* results without the cooperation of his conductor. And you cannot successfully train and educate car crews to the use of minimum power without an automatic and reliable means of recording individual and crew efficiency.

The Arthur Power-Saving Recorder

provides that means.

It is simple—inexpensive—reliable—easy and economical to install and maintain.

It shows exactly how many minutes power is on during a run or day and whether the brakes are used roughly and to excess. It therefore provides an exact basis for determining the relative efficiency of car crews.

It requires no use of live wires—no switches—no resistances—no shunts.

It conserves power and car equipment. Checks waste. Insures safe, careful car operation.

It has *proven* its value.

The Arthur Power-Saving Recorder Co.
Second National Bank Building, New Haven, Conn.

"Power wasted is the true measure of the motormen's relative efficiency"

Protect Your Premises

Light Up Approaches and Surroundings.
Night Prowlers Shun Premises Guarded by

Imperial Flood Light Projectors







What Floodlighting can do for you is told in our Catalog No. 303. Write for your copy.

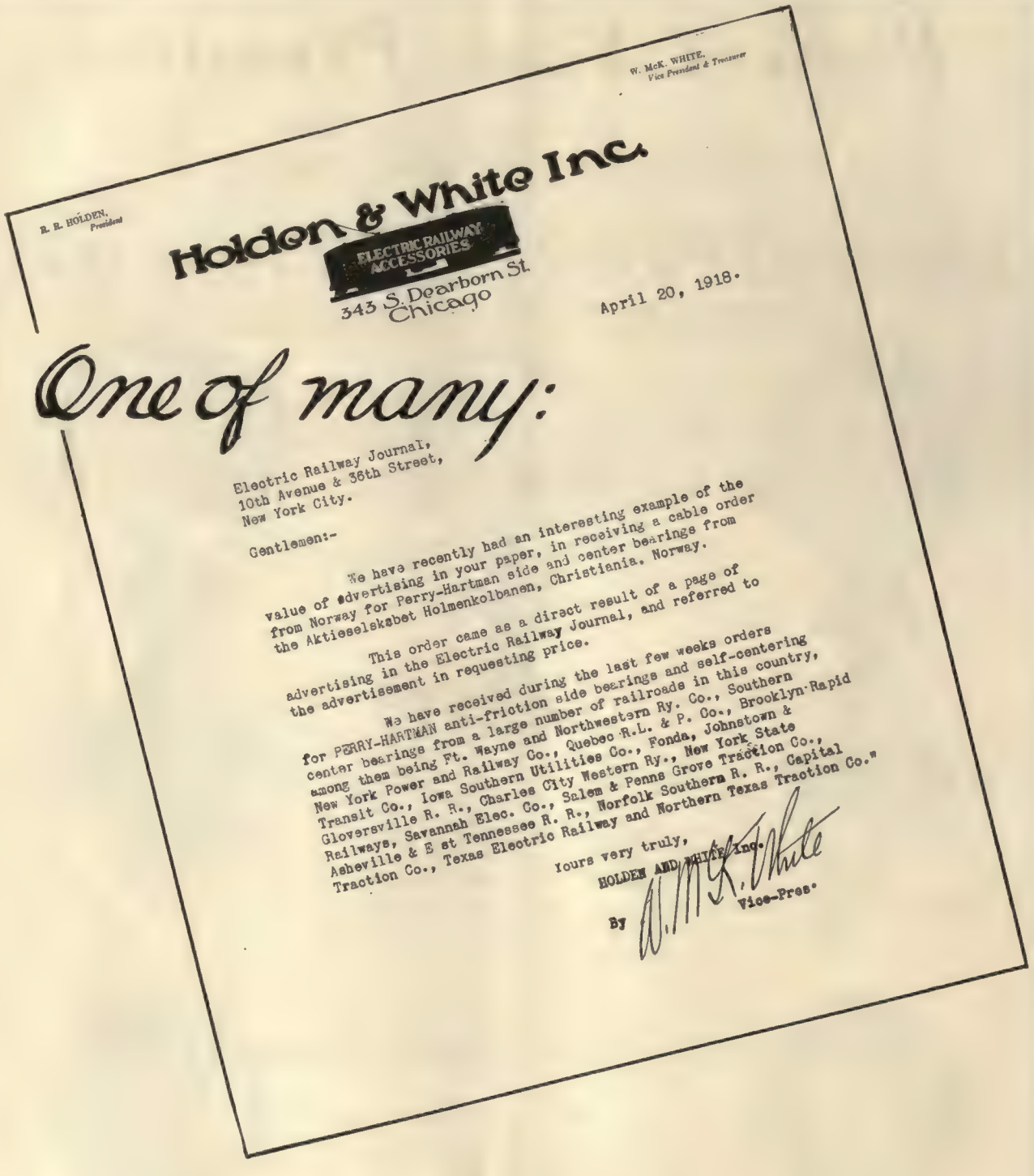


Imperial Flood Light Projectors are made in styles and sizes to meet every requirement.



CROUSE-HINDS COMPANY
SYRACUSE, N. Y., U. S. A.

NEW YORK BOSTON CHICAGO



R. B. HOLDEN, President

W. McK. WHITE, Vice President & Treasurer

Holden & White Inc.

ELECTRIC RAILWAY ACCESSORIES

343 S. Dearborn St. Chicago

April 20, 1918.

One of many:

Electric Railway Journal,
10th Avenue & 36th Street,
New York City.

Gentlemen:-

We have recently had an interesting example of the value of advertising in your paper, in receiving a cable order from Norway for Perry-Hartman side and center bearings from the Aktieselskabet Holmenkolbanen, Christiania, Norway.

This order came as a direct result of a page of advertising in the Electric Railway Journal, and referred to the advertisement in requesting price.

We have received during the last few weeks orders for PERRY-HARTMAN anti-friction side bearings and self-centering center bearings from a large number of railroads in this country, among them being Ft. Wayne and Northwestern Ry. Co., Southern New York Power and Railway Co., Quebec R.L. & P. Co., Brooklyn Rapid Transit Co., Iowa Southern Utilities Co., Fonda, Johnstown & Gloversville R. R., Charles City Western Ry., New York State Railways, Savannah Elec. Co., Salem & Penns Grove Traction Co., Asheville & E st Tennessee R. R., Norfolk Southern R. R., Capital Traction Co., Texas Electric Railway and Northern Texas Traction Co."

Yours very truly,

HOLDEN AND WHITE Inc.

By W. McK. White Vice-Pres.

Electric Railway Journal

Tenth Avenue at 36th Street, New York

Member Audit Bureau of Circulation



Los Angeles, the unofficial capital of Southern California until American troops entered it in 1846. Then it was a mere handful of low white houses on San Pedro Bay, while today

A Thousand Miles of Track

are barely sufficient to serve its street and interurban electric lines.

There are few cities in the world that can point to such a remarkably rapid growth as Los Angeles.

In 1880 its population was 11,183; in 1890 it had reached 50,000, in 1900, 102,479; in 1910, 319,198, and in 1917, more than half a million!

Manufacturing, with the great crowds of wage earners *it collects,* is not so important a factor in Los Angeles as it is in our large industrial centers, but the long distances and the numerous prosperous suburbs have demanded and received an adequate electric railway service.

Can any man of sense assume for a moment that a community could grow in size and prosperity at this rate if such growth were not fed by ample transportation facilities?

And is it not equally logical to assume that

Galena Oils

have maintained supremacy during a half century simply because their superior excellence has been fully demonstrated?

Galena-Signal Oil Co.

Franklin, Pa.

Packard

TRANSFORMERS *Everywhere* are Helping to Win the War



The photos show Packard transformers in some of the large plants working on war orders. These are but a few of them. Everywhere are Packard transformers helping to win the war by keeping the wheels turning in spite of the tremendous strain of war work and everywhere Packards are proving equal to the task.

Write for transformer bulletin E. R. J. 206.

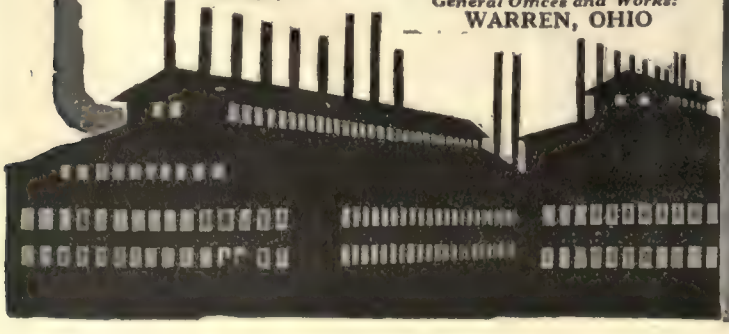
The Packard

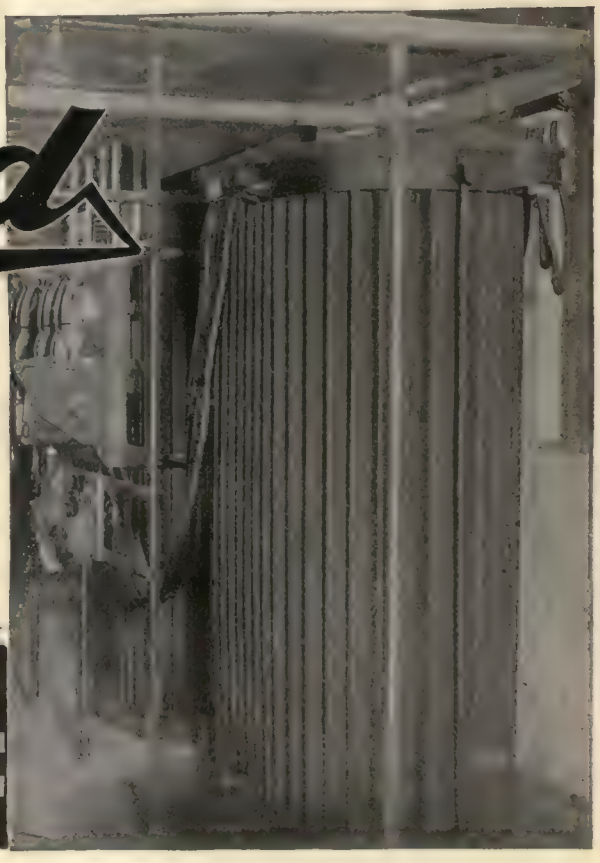
Electric Company

REPRESENTATIVES: Electric Appliance Co., **Chicago, Dallas, New Orleans, San Francisco**; Post Glover Electric Co., **Cincinnati, Ohio**; H. I. Sackett Electric Co., **Buffalo, N. Y.**; Electric Service Supplies Co., **Philadelphia, New York City, Chicago**; Charleston Electrical Supply Co., **Charleston, W. Va.**; Frank Ridlon Co., **Boston, Mass.**; Burton R. Stare, **Seattle, Wash.**; Braid Electric Co., **Nashville, Tenn.**

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General Offices and Works:
WARREN, OHIO







No Fallible Human Element in the

Rico Coasting Recorder

is interposed between the performers (the motormen) and the performance (the record of no-power or COASTING TIME).



The mere fact that the Rico Coasting Recorder gives this trip-by-trip record of COASTING TIME only by use of the motorman's individual key, assures the immediate approval and cooperation of the man behind the controller.

Time is the Essence of Railroading

RAILWAY IMPROVEMENT CO. RICO 61 BROADWAY, NEW YORK



"A Great Net of Mercy Drawn Through an Ocean of Unspeakable Pain"

What Your Red Cross Dollars Do

An accounting of Expenditures of the First Red Cross War Fund

Every one of the twenty million and more Red Cross members is entitled to this statement. Your local Red Cross Chapter can give you further details.

First War Fund Appropriations up to March 1st, 1918

Foreign Relief:	
Relief in France	$30,936,103.04
Relief in Belgium	2,086,131.00
Relief in Russia	1,243,845.07
Relief in Roumania	2,676,368.76
Relief in Italy	3,588,826.00
Relief in Serbia	875,180.76
Relief in Great Britain	1,885,750.75
Relief in other Foreign Countries	3,576,300.00
Relief for Prisoners, etc	343,304.00
Equipment and expenses in U. S. of Personnel for Europe	113,800.00
Total Foreign Relief	$47,325,609.38
Restricted as to use by Donor	2,520,409.57

United States Relief:	
U. S. Army Base Hospitals	$ 54,000.00
U. S. Navy Base Hospitals	32,000.00
U. S. Medical and Hospital Work	531,000.00
U. S. Sanitary Service	403,000.00
U. S. Camp Service	6,451,150.86
U. S. Miscellaneous	1,118,748.41
Total U. S. Relief	$8,589,899.27
Working capital for purchase of supplies for resale to Chapters or for shipment abroad	15,000,000.00
Working cash advances for France and United States	4,286,000.00
Total of War Fund Appropriations	$77,721,918.22

At the close of the first year of the War the Red Cross goes to the public for the raising of the Second War Fund with a record of appropriations which warrants continued contribution to this great relief work. As an influential citizen of your community, join with your local Red Cross Chapter to make this campaign successful. Your Red Cross is the Army behind the Army. Give till your heart says stop.

Second Red Cross War Fund Week May 20-27

This space contributed to the Winning of the War by
GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.
through the Division of Advertising, U. S. Government Committee on Public Information



Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 New York, Saturday, May 4, 1918 *Number 18*

Working and Fighting Must Go Hand in Hand

BEFORE we have gone very much farther in the present war those who are legitimately behind the lines must realize that their work is just as essential as that of the men in the trenches. Uncle Sam will give to millions of effective men the privilege and duty of working in this country while he sends other millions to France. If those who stay at home are to contribute their proportionate part to the winning of the war they must somehow get a firm conviction that they are in the fight to the finish. This is more difficult to do than it is for the men in the trenches because our soldiers are closer to the actual firing and trench digging. With the right spirit, however, a man can be just as much a patriot while twirling a controller handle, collecting fares, repairing a trolley wire, scraping a turbine bearing or winding a motor armature as he would be in bayoneting a Hun. There is less thrill to it, of course, but the two acts are intimately related.

For every man-hour of actual fighting at the front there must be hundreds of man-hours of work behind the lines. Fighting is intensive, behind-the-line work is extensive. Just as an apple is small compared with the tree which produces it, so the firing line is quite limited in extent compared with the millions of square miles of territory backing it up. It seems so obvious that the war must be won at home as well as abroad that the appalling and disheartening indifference which still exists is hard to explain.

Dr. Charles A. Eaton, of the Federal Service Section of the Emergency Fleet Corporation, in the course of his recent visits to the large shipyards was accosted by a burly ship carpenter. The latter asked the doctor what he thought he was looking at, and the doctor diplomatically replied: "A sturdy New England ship carpenter." The man replied "No, sir, you are looking at a blithering idiot who, until now, has not realized that in working at his trade here he is backing up his boy on the firing line." Probably thousands of men in the electric railway field have not yet awakened to the same realization. It is high time that they should do so.

Electric Railways Must Move More Freight

In the conviction that electric railway track is not being effectively used at the present time, and that its use in transporting freight is essential to the truest economy of expenditure of our national resources, the editors of this paper have arranged for a comprehensive analysis of the subject. Next week's issue will be largely devoted to the possibilities of hauling more freight on electric railway lines.

Put All War Transportation and Housing Under One Head

THOSE who spend even a few days in Washington will begin to appreciate the difficulty of so vast a machine finding or co-ordinating itself overnight. While every man is burning to do his best, it would be a miracle to find no multiplication of effort!

At present the Ordnance, the Quartermaster's, the Labor and the Navy departments are grappling with the problems of local transportation as it affects their own workers. The Navy Department, for example, recently commandeered the defunct electric railway at Cape May, N. J., and set it to work. There have been occasions when Uncle Sam sent four different sets of representatives to look over a situation, each set quite ignorant of the doings of the others. Naturally the first comer seizes all the facilities in sight, much to the grief of the tardier departments.

Now with the formation of the passenger transportation service section of the Shipping Board there is available a government agency with a personnel drawn directly from the electric railway and related fields. As its basic assignment is to relieve our direst need—to help produce ships, ships and more ships—this section should be entitled to primacy in securing transportation relating to the building and equipping of shipyards and ships. It would be manifestly injurious to the national welfare to have the scores and possibly hundreds of utilities that are involved subjected to contradictory orders of different departments.

But we may go a step further than this co-ordination of coastal properties. If one section of local transportation specialists can do this best it should also be held responsible for inland electric railway transportation in serving cantonments, aviation fields, manufacturing and supply centers, etc. The Director-General's staff, as at present constituted, has no electric railway specialists on it, despite the fact that we have nearly 50,000 miles of electric railways. This has resulted in overlooking some valuable electric railway freight and passenger handling facilities. In one state, for example, an electric interurban has not been used for camp transportation despite lower fare and better facilities. There must

be many cases like this, regardless of the opportunities of enlarging the rolling stock and extending the track of electric carriers at small outlay for big results. Obviously all problems of this character can be solved by co-operation between the service section and the Director-General's staff without disturbing the steam trunk-line and big terminal functions of the latter.

We believe it would also be eminently desirable to have the housing experts work hand in hand with the service section. Before going to the trouble and delay of getting thousands and thousands of tons of building material and countless workmen, it is but common-sense to let the transportation specialist determine if it is possible to transport the workers from near-by communities where many have lived for years. Let us bear in mind that 1000 tons of railway material may do more to improve the present industrial situation than 100,000 tons of housing!

Union Leaders Should Translate Words Into Deeds

THE Amalgamated Association of Street and Electric Railway Employees of America recently took pride in publishing letters written by President Wilson, Secretary Daniels and other government officials in appreciation of the patriotic "declaration of policy" adopted by its general executive board. This declaration strongly emphasized the sacredness of contracts in the present crisis.

One paragraph of the policy said: "Our contracts with employing companies must be observed by our membership. We demand contract observance by the companies, and it is our duty to render strict observance in return. Wherever controversies arise between our local divisions and employing companies, ample means are provided in the contracts and in the laws of our association for adjustment, without resort to drastic acts that repudiate obligations and are in contravention of the laws that the members of this organization have pledged themselves to abide by."

The Amalgamated Association undoubtedly acted in good faith when it adopted this declaration of policy, but principles are sometimes difficult to put into practice. Striking evidence of this is found in the international headquarters of the association, Detroit, where last week a few score of employees broke off negotiations with the local railway and called an immediate strike, thus violating their arbitration agreement. The rebels have now gone back to work, and all differences are to be submitted to federal mediators. The incident is so important, however, that those responsible for the welfare of the Amalgamated Association cannot afford to pass it by.

Actions speak louder than words, and the sincerity of the Amalgamated leaders will be believed in or doubted as they punish or overlook such outbreaks as that in Detroit. In a recent editorial we urged labor leaders to keep a firm hand on employees who repudiate arbitration agreements. Again we say that it is not enough merely to urge employees to keep their contracts. While there seems to be no excuse for revoking the charter of the Detroit "local" in this case, the officials of the union should take drastic action against the recalcitrant members.

Inflexible Fare and Other Defects of Proposed St. Louis Franchise

THE city authorities of St. Louis need not feel that they have overstrained the civic conscience by approving the ordinance which was recently offered to the management of the United Railways Company. They are to be congratulated, perhaps, on having taken steps to settle the long pending controversy over franchise rights, but they must not be surprised if the security holders do not rush enthusiastically to accept a proposition which offers peace at a price involving the wiping out of a possible $40,000,000 of capitalization. Besides all this, the ordinance, according to the company's contention, does not provide for any extension to the life of existing grants.

The new ordinance, as outlined in the April 27 issue of this paper, is a compromise which, if it does appeal to the investors, will probably do so because it removes a cloud on the title which has interfered with financing and because its acceptance would pave the way to better public relations. The management refers to it as a "fairly good solution of a difficult problem." If an acceptance is filed within the time allowed, this action may be taken as evidence that the "price of peace" is more agreeable than a prolonged controversy between the city and the company would be.

In scaling down the capitalization of the St. Louis property, the authorities have followed the example set in Chicago, Cleveland and other places where compromises were reached by sacrificing the investors. This form of public policy, even when based on expert judgment, is not to be highly indorsed. The money placed in these properties by street railway pioneers should not be recklessly wiped out by city mandate merely because equipment has been discarded as obsolete. Investors must be compensated for every dollar put into a property. Otherwise there will be discouragement tending to hold back capital from a progressive management.

The St. Louis ordinance is not abreast of the times in regard to the provision for rates of fare. Our old friend "Nichol Coyne" is still retained as the standard until such time as the State commission may see fit to raise or lower the price of a ride. This must have been a disappointment to fair-minded students of transportation charges, who appreciate that the flexible fare based on a service-at-cost plan is the modern solution of this problem. Perhaps when the time arrives when it is necessary to accept or reject the franchise the State commission will have given a favorable reply to the petition of the company for the right to charge a higher fare.

City authorities who are called upon from time to time to grant new franchises or to amend old ones will do well to approach such undertakings with minds unbiased by political considerations or prejudice against corporations. The settlements which they arrange will have an effect for many years not only on the people who have put their money into these utilities but on that portion of the public which uses the cars, because in the last analysis service can be supplied only to the extent that it is possible to pay for it out of the fares collected. An inflexible rate of fare will not render flexible service.

A Cartoonist Needed to Portray the Situation in New York State

Now that you've got it
What are you going to do with it?
Cartoonist Goldberg.

IT WOULD take a Goldberg to do real justice to the electric railway situation as it has developed in Rochester, Syracuse, Utica and other cities served by the New York State Railways—and in numerous other municipalities where the authorities joined in every possible measure to prevent the street car companies getting increased revenue with which to meet the increased costs of service.

If it were not so serious a matter, one might smile—momentarily—with the genial cartoonist, whose whimsical pictures have pierced with keen understanding the true inwardness of so many commonplace events by a few deft pencil strokes. Very often in life we strive might and main for something which, when we get it, becomes a problem instead of a joy. We realize upon its attainment that we really didn't want it at all, and we're about as happy with it as the toad that swallowed the bumble bee.

It is now nearly nine months since the electric railway companies of New York petitioned the Public Service Commission for increased revenues, placing before the commission an absolutely complete line of testimony bearing upon every pertinent feature of the case. This testimony went practically unchallenged. The city officials, under the leadership of the Mayors' Conference, finally secured a victory in the Court of Appeals, whose decision, in brief, was this: that under the present public service commission law an electric railway company whose fares are limited by contract or franchise, cannot secure an increase in such fares through the commission. It must be obtained through the local authorities.

The victory seems to be of the Pyrrhic variety. The employees of the New York State Railways have made demands for increased wages. Conferences of the employees, union leaders, city officials and officials of the companies make clear that the demands of the employees are justified. The companies' figures of revenues, expenses, etc., show plainly that the enormous wage increases demanded cannot be granted without increased revenues.

Now come various city officials making statements to exactly the above effect. Mayor Walter R. Stone, of Syracuse, is quoted by the *Post-Standard* in the following language:

> The justice of the men's demands for more money is apparent. The company claims it can't concede the increase with increased revenues. I believe that some common ground can be reached by free discussion of the factors in the case by the officials of the cities affected together with representatives of the company and of the men.
>
> So far as the city is concerned, we must have good service. We must insist that capable men be retained to operate the cars. The company must keep its trackage in shape and must take care of its share of the pavements in the streets. It is true that the present revenue of the lines does not warrant increases and will not allow the company to carry on essential improvements. Some arrangement should be made to increase their revenue.

Governor Whitman is quoted in the Syracuse *Journal* as saying to Owen Lynch, president of the Trolley Men's Union:

> I know the employees of the trolley lines in your city are not getting money enough to meet their necessary living expenses, and I also know that the railway company is not receiving income enough to enable it to increase the wage rate of its employees. In view of the decision of the Court of Appeals, I am now unable to assist the trolley workers in their critical condition.

Stewart F. Hancock, corporation counsel of Syracuse, is quoted in the Syracuse *Post-Standard* as having made the following statement:

> I believe that the employees of our street railways are entitled to a substantial increase in wages. The employees have said that they are willing that the truth of the company's contention be settled, either by the Public Service Commission or by arbitration. We have said, I now repeat, that as one of the six cities served by the New York State Railways, we are not only willing but anxious that the question be determined. We believe that at the present time efficient street railway service is necessary not only for the good of the city, but for the good of the country.

President Lynch said:

> More employees are leaving the trolley service daily. Some of them have been working on the line for twenty-five years. It is hard for them to give it up and accept employment in shops where they are not familiar with the operations. They will be forced to abandon operations on the lines if not granted the wage increase. All we ask is a square deal on the part of the public. If the accounts of the railroad officials can be proved to be correct, I see no reason why city officials should not be willing to grant a 6-cent far or 2 cents for transfer charge, in order to restore standard conditions of service.

The above statements need no interpretation. They admit the whole case of the railways. Confirmation of the accuracy with which they outline the situation is found in the statement that the Syracuse property this week was obliged to discontinue the operation of one car on each of its lines, owing to its inability to procure the labor at the price it is able to pay.

Nevertheless, the facts in relation to trolley service in the great upstate cities of New York were just as clear last August as they are now, nine months later. No facts have been concealed; no facts can be concealed. The accounts of all of the railway companies are kept in forms prescribed by law. They are sworn to; they are checked by public service officials. There is no line of business, not even municipal or state affairs, concerning which the general public has available so much and so accurate information as it has about the business of the public utility companies.

The city officials who fought the fare increases now admit the justice of the position taken by the railways almost a year ago. The railways have been forced to go on, month after month, incurring losses that were just as well understood in 1917 as they are in 1918. The difference is this: In 1917 the city officials could not be brought to admit that the municipalities cannot be prosperous without efficient public utility service and that public utilities cannot be efficient without prosperity. When their prosperity is reduced and fare increases are refused, the public's service must necessarily be reduced.

A wise public will now begin to appreciate that the efforts of the Mayors' Conference to prevent increased fares have served only to injure the public which they so vociferously declared they were trying to protect. If it is true that their opposition to fare increases was based largely upon political motives, they would be dull, indeed, not to see that their political shotgun has utterly missed fire.

Traffic Study in Pittsburgh

City's Sharp Changes in Grade and the Natural Barriers Around Its Business District Make Transportation Problems Difficult — Traffic and Industrial Surveys Help to Suggest Remedies—Elevated and Subway Line Proposed

E. K. MORSE, transit commissioner of Pittsburgh, has made an extended report on the existing transportation facilities of that city. Briefly, the report recommends the passage of very strict parking regulations for automobiles, the widening of several streets and a rapid transit program to be carried out in two sections. The first line to be built would consist of 1 mile of subway and 12 miles of elevated double track, from the central business district out Penn Avenue to the East End. The report suggests that these lines be municipally owned but operated by the same company that operates the surface car system, provided a satisfactory agreement between the city and the operating company can be reached. If not, the city should build and lease the lines to another private company or, as a last resort, could operate them itself. A brief abstract of some of the salient features of the report follow.

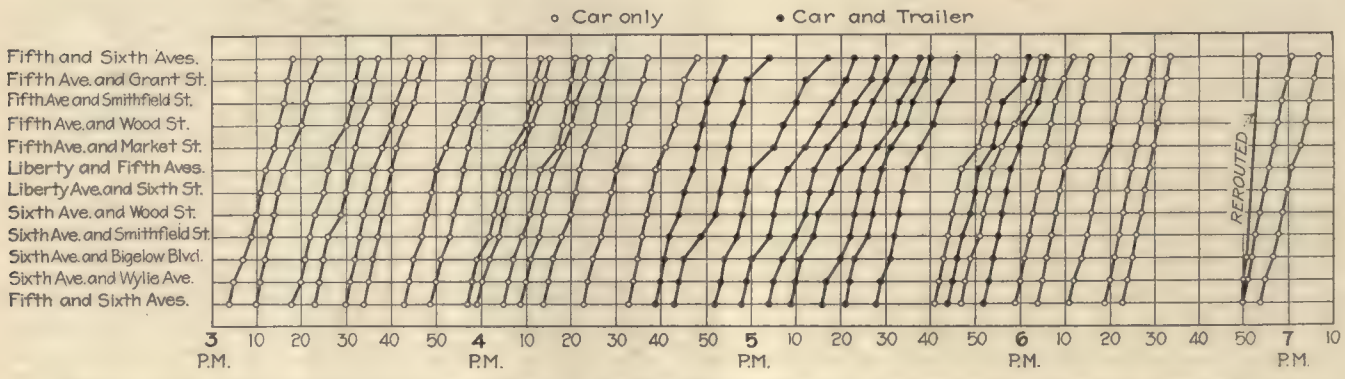


FIG. 1—DISPATCHER'S CHART FOR TYPICAL DOWNTOWN ROUTE IN PITTSBURGH, SHOWING EFFECT OF CONGESTION DURING RUSH HOURS

TOPOGRAPHICAL FEATURES OF PITTSBURGH

Transportation conditions in Pittsburgh are complicated by the succession of ridges and valleys on which the city is built. The business section at the western end of the peninsula formed by the Allegheny and Monongahela Rivers is level but contains only 218 acres, of which only 124.6 acres are actually used for mercantile and manufacturing purposes, the rest being taken up by streets, wharves and railway terminals. Although there are a number of districts within the city scantily populated because of the steep hillsides, the population per acre is twenty-two and one-half, and the city is fifth in density in the United States among the large cities, being exceeded only by Baltimore, New York, Boston and Milwaukee.

The electric railway problem in Pittsburgh is more difficult than in the average city, for the following reasons: first, the main arteries of travel from the residential to the business district are comparatively few in number because of the hilly nature of the country; second, the topography precludes straight streets; third, the streets in existence are far too narrow; fourth, the grades are excessive, there being hardly a car line in the city that at some point does not have a grade of more than 5 per cent and many of the lines have grades as high as 9 per cent; fifth, the amount of thinly settled territory and the fact that many of the lines draw their business from territory on one side only prevent traffic from developing to the extent that would otherwise obtain; sixth, the arrangement and narrowness of the streets in the central district and the awkwardness of the loops due primarily to this narrowness cause congestion and delay both to street car and vehicular traffic.

The surface railway collected on an average week day in 1916 a total of approximately 761,000 fares. Only about 12 per cent of the passengers used transfers, as the transfer privilege is somewhat limited. The rides per capita per year is 217, which is low compared with other large cities of the country.

The electric lines in the Pittsburgh district are operated by the Pittsburgh Railways with approximately 600 single-track miles of street and interurban line, of which about 300 miles lie within the city limits of Pittsburgh. The tracks were built and are owned by a great number of separate corporations whose properties are leased to the Pittsburgh Railways. The terms of these leases vary from a fixed lease for 999 years to a lease for one year with a privilege of cancellation by either party on a month's notice after its expiration. Most of the leases are for 999 years.

TRAFFIC SURVEY

A traffic survey was undertaken and many interesting data were compiled. The congestion in the central business district in the afternoon rush hour is clearly shown by Fig. 1, which is a dispatcher's chart for a typical route and shows the elapsed time between stops for the cars passing around the loops in the central business district. Most of the lines which reach the business dis-

trict are looped back there. It is possible from this chart to determine the points at which time is lost by observing the change in direction of the lines.

The load in the direction opposite to the rush travel is very light. Fig. 2 gives a chart for a typical line, the Bloomfield Line. The distances in miles are given from the center point of the downtown loop. The solid line shows the maximum morning and evening cars, the dotted line the average for the rush hours.

A traffic count showed that the average length of ride on the Pittsburgh Railways within a 5-cent fare limit is less than 3 miles.

To conduct the traffic count, a table of types of cars and seating capacities was furnished to each inspector, and his duty was to determine either the number of empty seats, if the seats were not entirely taken, or the number of passengers standing, if all the seats were filled, or the number of empty seats and number of passengers standing if there were both, as was sometimes the case. From the figures thus obtained, the total number of passengers could be quickly determined. As a check on the accuracy of the inspectors' counts, supervisors boarded every tenth or twelfth car and counted the passengers from the inside. It was found that in no case was there an error of more than 5 per cent. Upon these and other data obtained the suggestions in the report are based.

Vehicular Survey

A survey of the vehicles entering the central business district was made on July 2, 1917. Men were stationed on every street entering the central business district, so that a complete cordon was thrown around it, and no vehicle entered or left without being counted. The duration of this survey was twelve hours, from 7 a.m. to

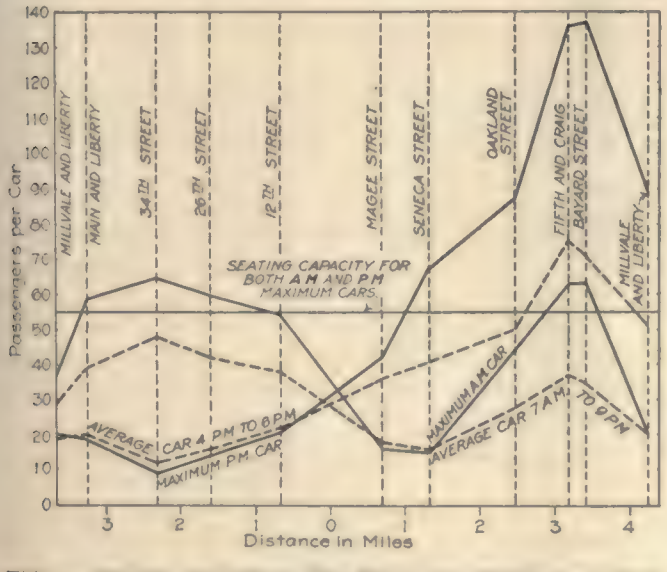


FIG 2—CHART SHOWING TRAFFIC ON TYPICAL ROUTE IN PITTSBURGH, DISTANCES IN MILES BEING GIVEN FROM THE CENTER POINT OF THE DOWNTOWN LOOP

7 p.m. Fig. 3 shows the vehicles entering and leaving, the lower line showing the number of vehicles remaining in the district at any hour. A count was also made of the number of vehicles passing certain busy corners, as well as of the number of vehicles parked on the principal streets and the time parked. Many were found

TABLE SHOWING PERSONS ENTERING BUSINESS DISTRICT ON TYPICAL DAY

Persons traveling on street cars	165,452
Persons traveling on steam railroads	30,930
Persons traveling in automobiles	37,805
Persons walking	47,816
Total	282,003

to be parked for five, six and seven hours, although the limit allowed by ordinance is thirty minutes.

Surveys were also made of those who entered the

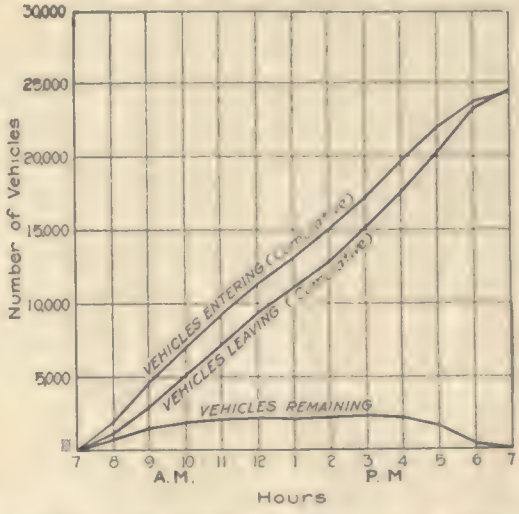


FIG. 3—CHART SHOWING NUMBER OF AUTOMOBILES ENTERING AND LEAVING PITTSBURGH BUSINESS DISTRICT ON JULY 2, 1917

business district by railroad and by walking and the hours. The table above shows the total.

Of this total 78.4 per cent was counted and 21.6 per cent was estimated.

Industrial Survey

An industrial survey was also made to determine the extent to which transportation facilities were required by workers going to their work. In Pittsburgh, the largest group of persons forming the traffic of the day is composed of the employees of the industrial and commercial establishments; consequently, a survey of the movements of this group was considered of greater value than any other single study of traffic conditions. The method followed was as follows:

The city was divided into sixty-five sections, the boundaries of the sections being natural, such as ravines, hills, etc., or halfway between parallel car lines. Each section received a key number. Loose-leaf tally sheets were printed for the different sections, and small reproductions of the city map, divided into these sections, were made as recording sheets. With this material squads of three men were sent to the offices of employers where they were permitted to see the employment lists, or in some cases only, lists of the addresses of the employees. The first man read the address, the second, who had expert knowledge of the city map, located the address and called off the section number, and the third made one tally on the proper tally sheet. The Chamber of Commerce had paved the way for this survey and had explained that it would not be used in any way to injure either the employer or the employee, as no record of names was to be made. This explanation brought complete co-operation, and in no

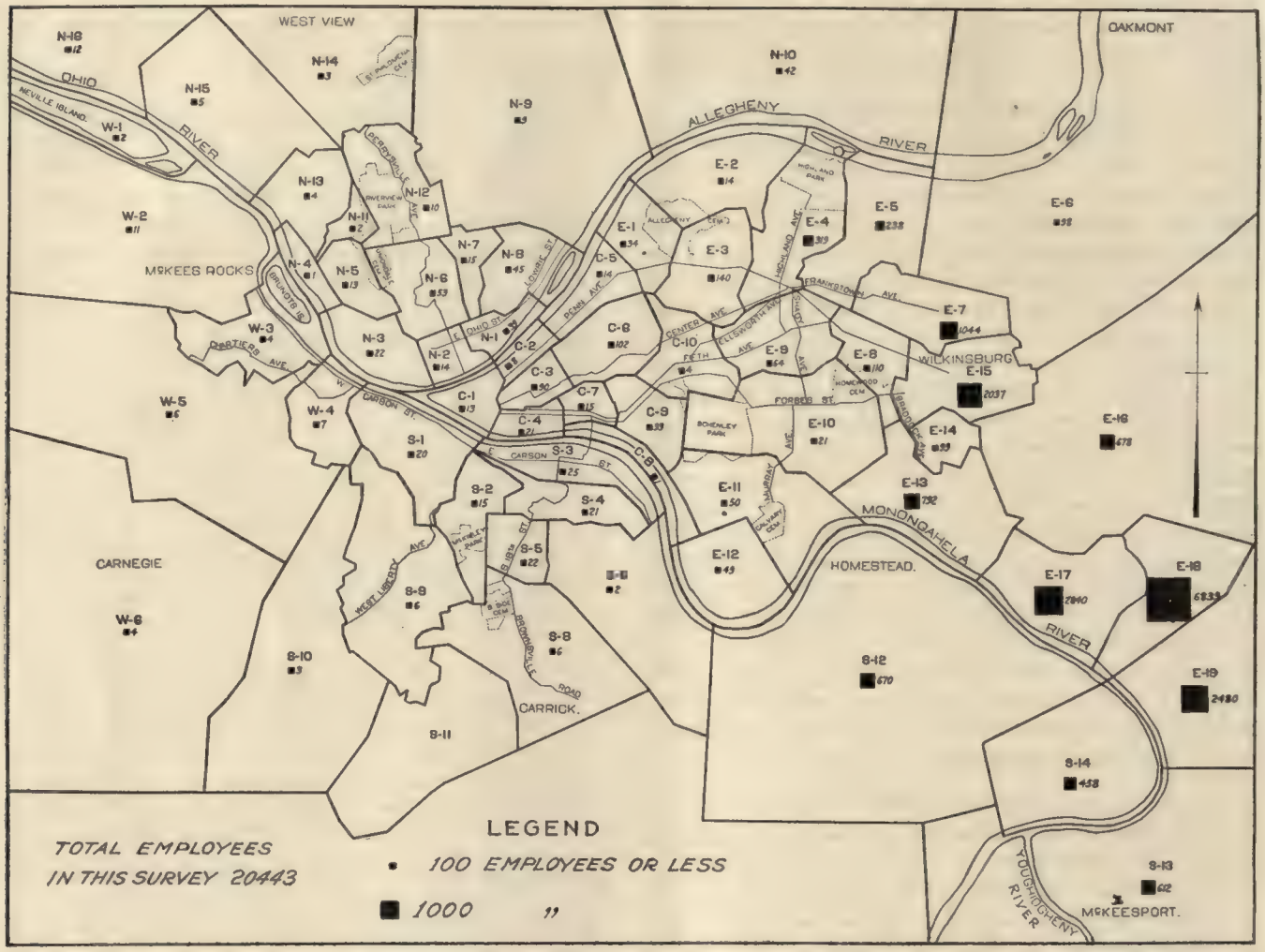


FIG. 4—THE CITY WAS DIVIDED INTO SIXTY-FIVE SECTIONS FOR THE INDUSTRIAL SURVEY—THIS CHART GIVES THE LOCATION OF THE RESIDENCES OF THE EMPLOYEES IN THE INDUSTRIAL PLANTS IN SECTION E-18

case were the requested data refused. Altogether, 274,000 employees were checked and the following totals were obtained:

TABLE SHOWING DISTANCE TRAVELED BY PERSONS GOING TO EMPLOYMENT

Data on Travel of Employees:	
Number of employers	700
Number of employees	274,083
Number traveling from 0 to 1 mile	122,223 or 44.6%
Number traveling from 1 to 2 miles	69,132 or 25.2%
Number traveling from 2 to 3 miles	26,906 or 9.9%
Number traveling from 3 to 4 miles	41,146 or 7.7%
Number traveling from 4 to 5 miles	15,167 or 5.6%
Number traveling from 5 to 6 miles	9,709 or 3.5%
Over 6 miles	9,700 or 3.3%
Average length of ride:	
Disregarding fare zone:	
1-mile walk	2.95
2-mile walk	4.12
Within 5-cent fare zone:	
1-mile walk	2.20
2-mile walk	2.86

The census of population for the district covered by this industrial survey, taken late in 1916, is 1,160,000 persons. This estimate was used for the summer of 1917 when the survey was made. On the basis of one person in every three as an industrial worker or student in the advanced schools, the total number of such persons would be 386,700. The check located 274,000 persons in all, or 70 per cent of the estimated number of industrial workers.

The final four significant lines in the table above give the distance which the employees ride, computed under two different assumptions. The last two lines give the average distance ridden for a 5-cent fare, assuming, in the first, that all persons living within 1 mile, and in the second, that those living within 2 miles, walk to their places of employment. The two lines under "disregarding fare zone" give the average distances traveled under the same two assumptions as to walking but regardless of the fare paid. They are of interest primarily as giving the average ride of the entire community, which is about the same as in Chicago where, however, a single fare covers the entire area. In these four lines the method of transportation is not taken into account, but owing to the preponderating percentage of persons using the electric lines, they give a measure of the proportion of riders paying two fares.

Recommended Means for Reducing Congestion

The report first takes up the subject of the parking of automobiles and says that although the prohibition of all parking is considered too drastic it suggests:

That no vehicles shall park on any street within the central business district for more than thirty minutes at one time.

That no vehicle shall park on either Oliver Avenue or Sixth Street at any time.

That no vehicles shall park within the hours of 7 a.m. to 9 a.m. and between 4 p.m. and 6 p.m. on any street on which street cars operate in the central business district except at specified places.

The report calls attention to the growth of heavy automobile traffic and recommends that the width of trucks, the overhang of loads and the carrying capacity of the wheels should be limited by ordinance.

Within the central business district it also recommends the removal of encroachments on the sidewalk, the restriction of loading and delivery operation of the sidewalks to certain hours and the enlarging of sidewalk intersections where the lines of flow of pedestrian travel meet and form areas of maximum congestion and consequent discomfort to pedestrians. This can be done by taking a triangle at the intersection of two sidewalks from the building at that corner, as shown in Fig. 5, and by supporting the second story of the building on a column. Such a plan will involve the loss of only a small triangle from the ground floor space and can be made at comparatively small cost.



FIG. 5—SUGGESTED PLAN OF INCREASING SIDEWALK AREA AT INTERSECTIONS OF SIDEWALKS

Outside of the business district plans are suggested for widening thoroughfares and rebuilding bridges.

Surface Car Rerouting

A considerable portion of the report is devoted to proposed changes in car routes. In general, they are based on the following objects:

1. To shorten the average time of looping.

2. To assign to the short routes the loops extending farthest into the business district and to the long routes the shortest possible loop.

3. To combine as many as possible of the short routes by changing them to through routes across the district.

4. To establish a steam railroad station shuttle and belt around the district which will accept transfers from both through and loop routes.

5. To restrict the transfer privileges on the new through routes in the downtown district to transfers among themselves and to the shuttle and downtown belts, since the through routing proposed involves a loss to the railway of the fares of people at present crossing the district.

6. To have transfers given from the shuttle and downtown belt lines.

7. To combine as far as possible the separate routes operating over any trunk line into a single route, thereby supplying more frequent service to the passenger leaving the business district, even though requiring him to transfer from the trunk line.

The report also says that while it is advisable to retain the zone system of fares, an effort should be made to arrange those fares equitably so that the average length of ride determines the zone limits, also that



FIG. 6—PROPOSED RAPID TRANSIT ROUTE NO. 1—ITS ESTIMATED COST IS A LITTLE MORE THAN $7,000,000

where there is a conflict of interest between routes serving city territory only and routes serving boroughs outside the city, the routes serving city territory only should receive preference.

RAPID TRANSIT PLANS

The general principles laid down under which the rapid transit system should be constructed and operated have already been outlined. Fig. 6, page 845, shows proposed route No. 1. Route No. 2, proposed for later construction, begins at Allegheny, crosses under the central business district by Diamond Street, and then goes east by Forbes Street, Fifth Avenue, Ellsworth Avenue, and Frankstown Avenue, to the East End, and is largely subway. The report says that Route No. 1 has the advantage of first low cost and soon being self-supporting and recommends its earlier construction.

The elevated railway structure proposed is with ties embedded in ballast and supported on a concrete floor. The extent of elevated track is defended on the ground that very few localities have sufficient density of population to support a rapid transit system built entirely as subway. Modern practice, it is explained, approves the construction of subways in congested districts only.

The report discusses the suggestion of a downtown subway loop to care for the surface cars but rejects it because it will accomplish the removal of only part of the street cars from the surface, while it would not save time for the average rider nor increase the length of ride to be obtained for a single fare. Moreover, it will cost $5,000,000, or nearly as much as the first rapid transit line proposed, and will be a burden upon the city as it will earn no additional revenue.

Air-Raid Warning Sign in Croydon

A WARNING sign has been devised by T. B. Goodyer, general manager Croydon (England) Corporation Tramways, for use on the occasion of enemy air raids. As indicated in the accompanying illustration, Mr. Goodyer's experiment utilizes a tramway pole and illuminated letters. A light box framework is divided horizontally into two chambers, each having a set of electric lights. When an alarm is received, a man switches on the lights illuminating the "Take Cover" lettering. As soon as the information comes that the German raiders have been driven back to sea, this group of lights is switched off and those behind the "All Clear" sign are switched on. The box has a canopy which renders the illumination invisible from above.



TRAMWAY AIR-RAID SIGNAL IN CROYDON



VIEW OF PREPAYMENT AREA AT LOADING STATION

Handling Crowds at Ohio State Fair Grounds

New Loop Track with Prepayment Area Solves Large-Crowd Problem of Columbus Railway, Power & Light Company

IN ORDER to provide better service for the immense crowds in attendance on various occasions at the State Fair Grounds, the Columbus Railway, Power & Light Company, Columbus, Ohio, has built loading and unloading stations and a loop track there which has worked out with entire satisfaction. The loop was completed in time for use during the State Fair held in August last year, and the company was quite generally complimented by the citizens and visitors regarding the improved facilities. During that event 106,000 people were transported to and from the grounds in five days, three of which were days of considerably heavier traffic than the others. It was expected that the new facilities would be tested to a greater extent during the National Dairy Show in October, when the crowds are usually very much larger, but on account of the un-



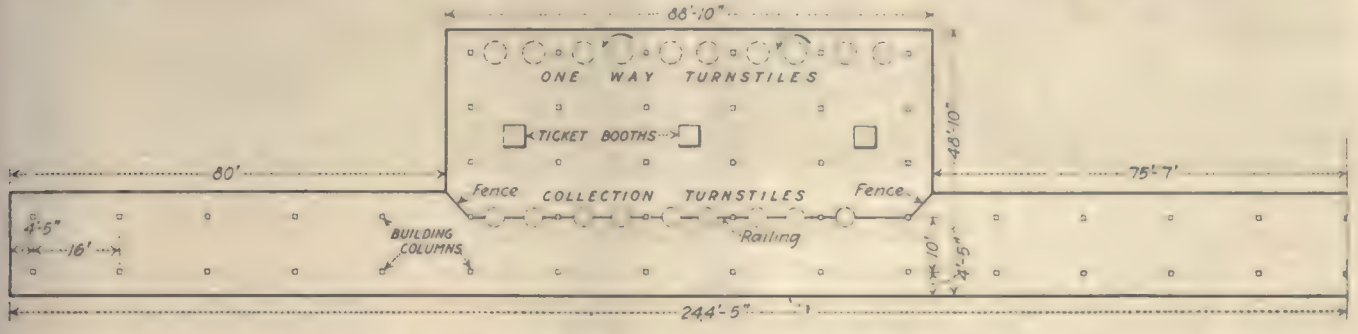
CROWDS AT THE LOOP BOARDING CARS

favorable weather conditions people attended in much smaller numbers than was anticipated.

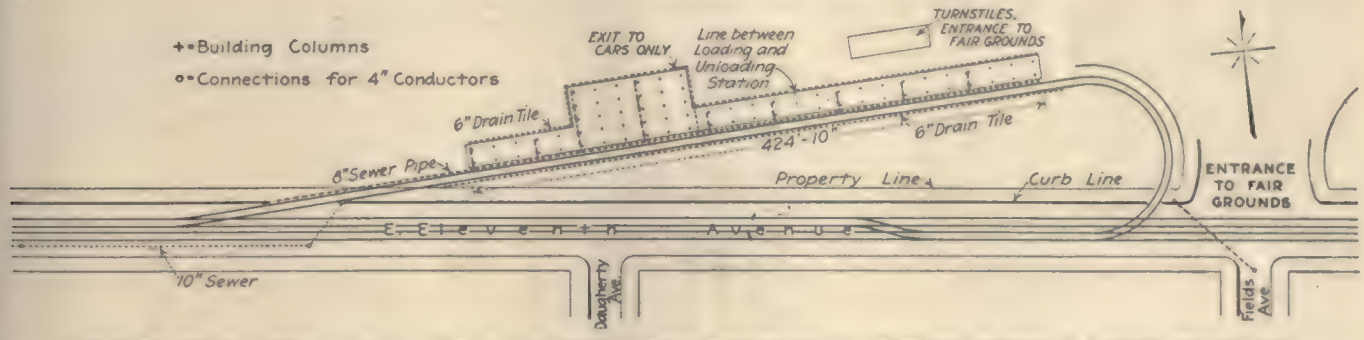
An idea of the track layout at the loop can be had by referring to one of the accompanying drawings. Previous to building the loop, the company had a spur track laid along East Eleventh Avenue coming from Cleveland Avenue on the east to the main entrance, and also a loop at the southwest corner of the grounds which

The loading and unloading stations are properly illuminated to take care of night operation, traffic generally being heavy on the first four nights of the week and light on Friday night.

Upon going to the cars the people leave the Fair grounds through one-way turnstiles and buy their tickets or secure change in the loading station at one of three portable ticket booths conveniently located.



LAYOUT OF LOOP TRACK AT ENTRANCE TO OHIO STATE FAIR GROUNDS



DETAIL OF LOADING AREA AT FAIR GROUND LOOP, COLUMBUS RAILWAY, POWER & LIGHT COMPANY

was used only during the State Fair or other events. From this point the people had to walk several hundred feet and cross the Big Four Railroad tracks, on which trains were not only a source of danger but often caused delays and much inconvenience, especially during bad weather. Upon the separation of the grades at this crossing, which was a part of a general program of grade-crossing elimination throughout the city, the traction company extended its line to join the spur already referred to and built a loop track and loading shelter just west of the fair ground entrance. It now operates on regular schedule over the line made by connecting the two branches.

The fair ground loop surrounds a small triangular-shaped park. Cars coming from the west encircle the loop and return, a cross-over being provided by which cars westbound from Cleveland Avenue can also transfer to the south track to enter the loop.

On the fair ground side is provided a shelter about 425 ft. long with a fence between the loading and unloading areas. A dispatcher's booth is built on this line adjacent to the track, from which the movement of cars for loading is directed. Extra cars are laid in at the old loop west of the Big Four Railroad and are drawn upon, as needed, by the dispatcher, who has all necessary telephone connection for speedily handling the cars. The dispatcher releases cars for loading at the loading station as the number of people in the prepayment area warrants.

Then they pass through collection turnstiles into a prepayment area, depositing their fares in fare boxes. Transfers are issued on the cars by conductors as desired.

Missouri Utility Commission Report

THE fifth annual report of the Missouri Public Service Commission, for the year ended Nov. 30, 1917, contains a general résumé of the activities of the various branches of the commission during the period under review. In connection with the work of the engineering department, it is stated that the matter of steam and electric railway clearances is now under consideration, as well as the matter of equipping street cars with fenders.

The analysis of accidents during the first ten months of 1917 shows a total of 237 killed and 4356 injured, twenty-nine and 2198 of these respectively being for electric railways. The property damage during the same period amounted to $226,370, the amount for electric railways being $2,666.

The report states that the continuation of the European War has materially reduced the demand of the investing public for utility securities. The securities authorized by the commission during the last fiscal year showed a decrease from those in the preceding year. Moreover, practically all of the authorizations were for other than electric railway purposes.





Kicks Against the Beeler Suggestions

They Are Not Fair, Sporty or Patriotic. So Let Us All Quit Knocking And Help the Country Win the War.

By EARL GODWIN.

We have to take things as they are.

If we could wave a magician's wand and produce a street railway system with double the carrying capacity of the present pair of roads we would do so and everyone would be happy.

SKIP-STOPS SPEED CARS AND RELIEVE CONGESTION

By BILL PRICE.

THE CAPITAL TRACTION COMPANY SYSTEM

By order of the PUBLIC UTILITIES COMMISSION the "SKIP STOP" system will be put into operation effective SUNDAY, APRIL 21, 1918.

Points where cars will stop for passengers will be indicated by yellow signs with black lettering "CAR STOP."

WATCH FOR **CAR STOP** YELLOW SIGN

STOPS FOR PASSENGERS WILL BE MADE ONLY AT POINTS SO MARKED

CAR SPEED IMPROVING

Beeler Skip Stops Show Saving of 15 Per Cent in Time.

PEOPLE ALIGHT TOO SLOWLY

Patrons Can Better Service by Being Ready to Leave Car, Says Mr. Beeler—Expert Declares That Man Who Blocks Aisle Near Door Is a Considerable Nuisance.

BROOKLAND MEN INDORSE CAR SKIP-STOP SYSTEM

$1,000,000 Worth of Food in D. C. Yards Is Goal Set by H. M. Conolly.

SKIP-STOP PLAN HERE GETS THE "ACID TEST"

Rush Hour Service Today Proves Utility of System, the Officials Say.



Above, at left, a car at "Car Stop" sign. At right, loading platform 10-in. high, eliminating one step for passengers. In the center, newspaper headlines indicate the success of the skip stop. Also window poster which provided advance information as to car stops. At bottom, view of "No Parking" sign which helped the police in preventing congestion at loading patforms.

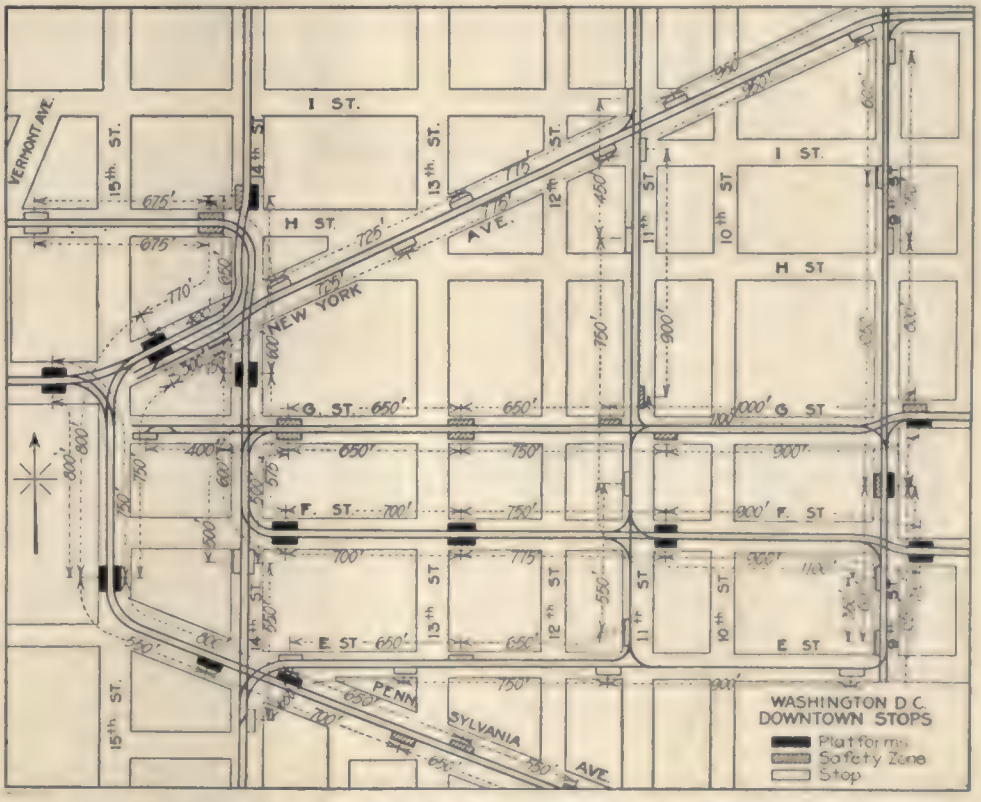
Skid Stop Received with Approval in Washington

Skip Stop at Washington Adds 10 to 15 Per Cent to Service

Co-operation of Public, Commission and Railways Leads to Immediate Success of Skip-Stop Plan—Elimination of More Than One-Third of Stops, Use of Vivid Stop Signs, Erection of Loading Platforms and Front-End Fare Collection Increases Schedule Speeds Materially

ON Feb. 7, 1918, John A. Beeler, consulting engineer, submitted the second of his unit reports to the Public Utility Commission of the District of Columbia. In this he recommended the abolition of more than one-third of the stops, particularly to clear up the congested downtown section. The downtown changes were made on Feb. 17 and April 7, for the respective railways and the skip stop applied to the entire District of Columbia on Sunday, April 21.

The throat of the Capital Traction Company, comprising a length of 2300 ft. on Fourteenth Street between Pennsylvania Avenue and H Street, was relieved on Feb. 17 by removing about one-half the stops and carefully rearranging the remaining ones for distances varying from 500 ft. to 750 ft. On April 7 the throat of the Washington Railway and Electric Company, F and G Streets between Seventh and Fifteenth Streets, received similar treatment, the spacing in one case being 1100 ft. The accompanying plan shows the stopping places of both companies in the downtown area and the distances between them. It will be observed that these stops frequently are located on the far side at congested junctions.



PRESENT LOCATION OF STOPS IN THE DOWNTOWN SECTION OF WASHINGTON, BOTH COMPANIES, AND DISTANCES BETWEEN STOPS

Before the new stops for the downtown section went into effect the newspapers had given wide publicity to the proposals through the medium of the unit reports; second, through the editorial comments which were distinctly favorable; third, notices in the cars, and fourth, through hearings before the Public Service Commission. Coincident with the inauguration of the system, prominent "Car Stop" signs were installed as described hereinafter. Also through the co-operation of Major Pullman, chief of police, the traffic officers gave the street cars the right-of-way over all other traffic. Loading platforms long enough to accommodate two cars at a time were placed at each stop to provide aisles of safety. About a dozen of these platforms are in use, the heaviest with front-end fare collection. Another two dozen platforms are under construction. These perform two useful functions; they accelerate passenger interchange in saving a step and they cause the people to congregate on the platforms instead of spreading out in the street, where they are in danger from automobiles.

The great improvement in the downtown section met with such approbation that the way was well paved for the extension of the skip stop to the entire community.

Sunday, April 21, was selected as the day for making the skip stop universal. According to calculations made by Walter C. Allen, executive secretary of the commission, the built-up sections served by the Capital Traction Company now have 352 instead of 576 stops, or a cut of 39 per cent, and those served by the Washington Railway & Electric Company, 591 stops instead of 944, or a cut of 37½ per cent. On outlying lines the stops total 155, which is only a 10 per cent cut inasmuch as these stops were not closely spaced before the Beeler survey was made. In general the city stops average 750 ft. or seven to eight to the mile. On busy Fourteenth Street, however, the spacing averages 780 ft.

What Those Interviewed Said About Skip-Stop Service

A white-haired
CAPITAL TRACTION MOTORMAN

The people will get used to the skip stop and like it. I remember when they used to get in front of the horses to make me stop in front of their homes; and they sure had fits when we stopped only at crossings!

WALTER ALLEN
Executive Secretary Public Utility Commission

The merest tyro can see that the skip stop will enable the companies to operate more service.

CHAIRMAN BROWNLOW
of the Public Utility Commission

The fact that nobody has protested against the skip-stop principle, and that of the half-dozen protests which were made most had some merit, is indeed satisfactory evidence of the feeling of the public.

W. F. HAM
Vice-President Washington Railway & Electric Company

The difference is that now our schedules are no longer paper schedules, they are carried out!

MAJOR PULLMAN
Chief of Police

This work would have been well worth while if it had resulted in nothing more than clearing up the Capital Traction Company's throat on Fourteenth Street.

J. A. HANNA
Vice-President and General Manager, Capital Traction Company

It is remarkable how the people have taken to it. The loading platform also helped wonderfully in keeping people who are waiting for cars from scattering over the street.

In spite of these important changes, public approval was practically unanimous. Mr. Allen says that but one adverse criticism was made in advance, and the half dozen later protests were readily allayed. To have had so little protest from a community of 400,000 people may well be considered remarkable.

To advise their passengers, both companies issued a window poster as shown, while the Washington *Star* published a complete list of stops in daily installments, a feature which actually was a beat in the eyes of the public. The trainmen received advance booklets giving a complete statement of the stops on every line, whether far, near or some other location. It should be said here that in every instance the stops are located with a view to the local conditions. In some cases they are several car lengths from the street intersections. Some nearside stops were changed to far-side stops, and vice versa.

Motormen are instructed to bring the car to a standstill with the entrance directly opposite the sign so that valuable seconds are saved in boarding. Through the co-operation of the police department, also, a non-parking clearing 96 ft. long, sufficient for double-berthing is being established in front of every stop. A standard alongside the "Car Stop" sign reads: "Please do not leave car between street car safety zone and curb."

Although a few wrinkles in traffic regulation remain to be smoothed out with the aid of the police department, the results to date are remarkably satisfactory. Where cars stood stockstill for minutes at a time or moved at the pace of a glacier, their movement is now so free that Washingtonians can scarcely believe their eyes. As riders they profess to believe that the running time has been cut nearly in half. Of course, this is psychological; but the reality of 10 to 15 per cent increase in the speed attained is satisfying enough to the operators.

As Mr. Ham intimates in the quotation elsewhere, the elimination of delays is quite as important as the increase over the former paper schedules. The Capital Traction Company has not yet prepared new schedules but has put preliminary running times in hand, pending the make-up of such schedules. For example, on Pennsylvania Avenue the thirty-seven and one-half minute westbound run is now thirty-three minute, and the thirty-seven and a half minute eastbound run is now thirty-two and a half minutes. It has become evident that the need was not for new lines, but for a clear track over which more cars and more miles per car could be operated. In fact, it is certain now that the forthcoming seventy cars ordered by the companies will find full use in taking care of increased travel, much of which will come out of present pedestrian ranks.

IMPORTANCE OF SIGNS

In discussing with Mr. Ham the matter of making the skip stop successful he said: "A proper sign is one of the absolute essentials." Those who see the sign adopted will admit that it is vivid enough to fulfill its functions admirably. As Washington has no poles or wires, the signs are in the form of standards 6 ft. 6 in. from the sidewalk to the center of a 12 in. yellow disk on which are printed on wood the words "Car Stop" in black. In some places white disk standards are erected bearing the legend: "Cars Do Not Stop Here." These signs and the presence of loading platforms save even the stranger from falling into error. The stop signs were obtained from the Traffic Sign & Signal Company, Gloucester, Mass.

CONSULTATION, PREPARATION AND CO-OPERATION PRODUCED SUCCESS

In view of the likelihood that the skip stop will be widely tried in the immediate future in response to the request of the Fuel Administrator to save coal, it is not amiss to point out that success in Washington is not the result of arbitrary action. First there was consultation with all the interests affected, second there was preparation in the layout of stops, and third there was co-operation in executing the proposals of the commission's consulting engineer. The skip stop, in brief, was put throught on its merits rather than as a temporary measure to meet an emergency.

The unified government of the District was a distinct aid. The District affairs are administered solely by a board of three men who constitute both the District Commissioners and the Public Utilities Commission. Thus all departments pulled together. Both the large local railway companies, as well as the interurbans, entered heartily into the spirit of the situation, even down to the standardization of such minor details as the stop signs.

As for the newspapers, the headlines and the subcaptions reproduced in the illustration on page 848 tell their own story.

Selling Service for a Fair Price

This Is the Big Job of Electric Railway Operators To-day—It Is Time for Them To Prove That They Are as Good Merchants as They Are Producers —How Salesmanship Paid One Railway

BY FRANK PUTNAM
The North American Company, New York, N. Y.

MANY American electric railway operators have begun to doubt whether service can be sold for a fair price.

They can produce it—given sufficient revenue. Nobody else knows so well how to do it. And they can produce it economically. They have had to, for years past.

They know how to run the service, but apparently they do not know how to sell it for a fair price. With labor and capital costs considered, few if any operators are getting a fair price for even the inadequate service which most of them now supply.

They are strong in the engineering and the administrative factors of the business. They seem to be weak, however, in the vital factor of salesmanship. They are good producers, but poor merchants.

THE PUBLIC MUST BE TOLD

Under commission regulation, electric railways have been trying to prove their need of more revenue to build new lines, buy more cars, pay better wages and assure to investors a fair return. The commissions have not, as a rule, been granting what the companies must get if they are to give the public satisfactory service.

Why? Because the public is the court of last resort—the customer controlling the commissions. The public must first be satisfied that a rate increase is needed in its own interest before commissions will think it safe to grant relief.

Electric railway operators, up against this fact, have "gone down to the tavern and cussed the court" for lacking courage to do what it knows ought to be done, and have let it go at that. They have been so busy blaming the commissions that they have overlooked their own share of responsibility—and it is the larger share.

There have been exceptions. A few companies have gone straight to the public in newspaper advertisements with statements which were *prima facie* proof that they needed more revenue in order to pay good wages, give good service and yield a fair return. Most of these, however, have not made a thorough job of it. They have not sufficiently trusted the public to lay all of their cards face up on the table.

The public is you and I and the other fellow. The public is always fair, even liberal, when it knows all of the facts. It is always suspicious, and properly so, when asked to approve transactions concerning which it lacks facts necessary to the formation of an intelligent opinion.

The utilities should create an informed public opinion to back up the commissions in constructive instead of punitive rate and service regulation. This proposition has been tested. I have had a hand in trying it out. It works.

During the past year I helped one utility to sell $2,000,000 of preferred stock across its counters, at par, to customers. The company got better than 97½ per cent net. It secured more than 3000 pocket-interested local partners, many of them active in promoting the company's business, all of them potential defenders of the company's rights against unjust attack from any quarter. It kept $140,000 a year at home—a 7 per cent dividend to its customer-partners. It held down the cost of service for all its customers, by saving $120,000 on the cost of new capital needed to pay for plant additions and betterments.

That company's position was exceptional. It had a record of excellent service at low rates. It had, a few months earlier, told its public, in a series of newspaper advertisements, all about its affairs and its policies. It told how it had substituted solid plant values for so-called "water"—injected unavoidably during the process of uniting many competing companies into one to serve the whole community at least cost—by declaring small dividends over a series of years and building itself up with earnings which the owners might have taken out with the approval of the State commission. Its clear, square, candid and complete statement of its conditions and policies, and its sale of shares to more than 3000 customers, abruptly ended a strong movement for a competing municipal system.

I expect to see that company finance all of its after-the-war extensions and betterments—and these will aggregate many millions of dollars as the city grows—by selling new issues of its stock, approved by the State commission, to its customers. I expect to see it, within ten years, have 35,000 home partners—a controlling minority of the electorate upon all public issues affecting its service. Its position, conditioned on continued good conduct, will be safeguarded against any wave of political radicalism. If finally taken over by the municipality, in deference to the theory that all public services should be owned by the public, it will not be robbed in the transaction.

MAKING A RAILWAY SITUATION PLAIN

I spent the last half of 1917 and the first five weeks of 1918 in telling the people of a Mid-Western city, through advertisements in its daily and weekly newspapers, all about the affairs, policies and needs of its electric railway system. Like many other railways this one, caught between the devil of the usurers, tax collectors and fixed fares on one hand and the deep sea of doubled operating costs on the other, finds itself unable to give satisfactory service, pay good wages or

make any return to its stockholders. Its difficulty being due chiefly to excessive city taxation and the non-compensatory character of the flat 5-cent fare with universal free transfers, and only to a small degree to over-capitalization, the company has very properly "passed the buck" to the city government and the State commission.

The company was asked to pay $2,500,000 of accrued taxes on franchise values confiscated by the State in 1913. It was asked to pay wage increases totaling more than $3,000,000 a year. It was asked to spend from $3,500,000 to $4,000,000 for new car lines urgently and long needed in districts which had no car service. It had a $3,500,000 first mortgage bond issue maturing on June 1, 1918. It had a treasury surplus of $3,000,000. Its net income, steadily diminishing year by year, was a trifle more than $600,000 in 1917. Obviously it could not meet the demands with its existing revenue.

Public Converted Through Publicity Campaign

When we began our seven-months advertising campaign, the city government and the daily press declared the company's city taxes must not be reduced more than an average of $85,000 a year for the term of the franchise, this reduction having been informally agreed upon by the city and company in preliminary conferences. Several of the forty-five advertisements used were devoted to proving from the public records that the company was grossly overtaxed and to exposing the injustice and the absurdity of taxing its franchises five years after all its franchise values had been confiscated by the State.

Within four months from the start the strongest newspaper opponent was editorially demanding that all of the company's franchise taxes, amounting to $480,000 a year, be repealed and, if necessary, that its property taxes be greatly reduced, as a possible means of avoiding an increase of fares. When the city government, eight months after the campaign started, passed the franchise ordinance, it repealed all of the $480,000 a year franchise taxes and substituted a gross receipts tax of one-half of 1 per cent, or $65,000 a year, thus cutting the taxes levied against the company $415,000 a year.

The city not only reduced the company's taxes but it conceded in the ordinance the State commission's authority to regulate fares. Now it is making only a formal protest before the commission against a fare increase, which it recognizes must be ordered if the company is to pay good wages, give good service, make necessary extensions and yield a fair return on the legitimate investment.

Without the advertising campaign the public would not have understood the necessity for a tax reduction and a fare increase. The city government would have been afraid to cut the taxes, and doubtless the State commission, not unnaturally, would have been reluctant to grant the additional relief which the whole community now knows is needed, in the public's interest as much as the company's.

The cost of the advertising was only a small part of the first year's saving in taxes. Beyond the direct financial relief which it helped the company to procure, the advertising strengthened the company's position by making the public understand these facts:

1. An electric railway, whether publicly or privately owned, is a branch of the public service.

2. The city and State governments are just as much obligated to assure ample good electric railway service as they are to assure ample good water, school and other public services.

3. As long as any branch of the public service is permitted to be built and operated at the cost and risk of private citizens, city and State governments, in the public interest, must let them earn enough to assure ample good service.

4. Aside from the rank injustice of it, the public's pocket loss is many times greater than that of the private investors when city and State governments prevent electric railways from earning enough to give ample good service, to pay good wages, to make necessary extensions and to yield a fair rental return for the money so employed.

I don't pretend to be either an advertising expert or an electric railway expert. I have been going to school for three years to a group of the most intelligent public utility men in America, and I do know some things about the American public. I know what the public, in any big American city, wants to know about its public utilities, and I dug out those facts and printed them, with all the convincing argument and punch I could put into them.

Some electric railway men told me I was giving the public more figures than it would take time to read or understand, and some advertising experts told me my copy wasn't "scientific"—whatever that is. Granting that these criticisms were probably true, we got what we went after, with the public's consent and approval. Real experts should be able to get equal or better results in less time and at a smaller cost. This case is cited merely to prove to electric railway operators that straight salesmanship applied to the public utility business will pay as well as it does in any other big business.

It Pays to Advertise

Too many electric railways, untrained in modern merchandising methods, have been indignant but dumb in the face of rising costs and increasing burdens of operation. They have been trying hard to make $1 of earnings give $2 of service and have been wondering, I suppose, why that fact did not speak for itself, and why it did not satisfy the demands of an unreasonable public.

The railways are only just now learning to employ the newspaper advertising columns, as all other merchants do, as a means of selling their service to the public for a fair price. They can do it, just as other merchants do it, when they realize that they are merchants and not chartered monopolists.

There is no sanctity in the 5-cent fare. There is no more reason why a street-car ride, each year costing more to produce, should remain forever at the fixed 5-cent rate, than there was for calico to remain forever at 5 cents a yard. The men who make and sell calico have advertised to the public the reasons why its price had to rise. The public, knowing why, pays the higher price without complaint.

There is no mystetry about the cost of electric railway service. The state now dictates the form in which the books shall be kept, to show every penny taken in and the nature of every item for which a penny is expended. It is up to the companies to sell their situation to the public—and thereafter keep it sold.

Here's How the Electric Railways Can Help to Build Ships

Passenger Transportation Service Section of United States Shipping Board Has Begun Co-operating With Electric Railways to Provide Real Transportation Facilities Quickly—Double-Tracking, Train Operation, Prepayment Areas and Staggered Hours Show Progressive Spirit and Foresight—Learn What Has Been Done by This Department and See Where You Can Help With Brains and Equipment

ON APRIL 1, the United States Shipping Board Emergency Fleet Corporation formally organized a Passenger Transportation Service Section with A. Merritt Taylor as manager of passenger transportation. By April 3 it had prepared and mailed a questionnaire for all shipyards, some 150, in the land; also for all shipping board district officers in charge of steel ship construction and all district supervisors in charge of wood, composite and concrete construction. By April 6 the War Board of the American Electric Railway Association had prepared and mailed a questionnaire in co-operation with the Shipping Board calling upon electric railways to state what equipment they could release for the latter's needs.

In the meantime, the staff for this vital part of the shipbuilding program was being built up rapidly, as indicated by the accompanying schedule of personnel in the panel on this page.

The functions of the staff are expanding and specializing so rapidly that it would be useless to make an organization chart. It will be more to the point to explain how the traffic surveys are made by the transportation engineers as this will give a hint to the electric railways affected as to what they are expected to tell the manager of the transportation department if they are to be of maximum aid in forwarding the shipbuilding and other war programs. While the procedure will vary with the circumstances, the following has been prepared as a general outline, and should prove of interest.

Personnel of Passenger Transportation Service Section as of April 26, 1918

Name	Title	Reported for duty	Past Employment
A. Merritt Taylor	Manager	Apr. 1	Pres. Philadelphia & West Chester Traction Co.
A. B. Maine	Executive Aide	Apr. 1	Chief Clerk, Dept. City Transit, Phila.
O. B. Cooke, Jr.	Engineer	Apr. 2	Member of Firm Kelly, Cooke & Co.
J. A. Renshaw	Jr. Asst. Engineer	Apr. 4	Asst. Engineer Dept. City Transit, Phila.
J. W. Welsh	Engineer	Apr. 8	Electric Engineer & Traffic Agt. Pittsburgh Railways.
W. C. Solly	Asst. Engineer	Apr. 8	Engineer, New Chester Water Company
C. G. Enz	Chief Clk. & Acct.	Apr. 8	Asst. Chief Clerk Dept. City Transit, Philadelphia.
M. I. Frantz	Stenographer	Apr. 8	Stenographer, A. M. Taylor, Philadelphia.
G. T. Seely	Asst. Manager	Apr. 11	Assistant General Manager, Chicago Elevated Lines.
M. W. Rew	Asst. Engineer	Apr. 12	Chief Engineer, Pittsburgh Transit Commission.
J. C. Thirlwall	Engineer	Apr. 15	Electrical Engineer, General Electric Company, Schenectady, N. Y.
C. F. Hewitt	Engineer	Apr. 15	Private Engineer and formerly General Manager, United Traction Co., Albany, N. Y.
D. C. Ainey	Progress Engr.	Apr. 15	Assistant Engineer, Public Service Commission, Harrisburg.
Jilson J. Coleman	Engineer	Apr. 22	Agent for Manufacturing Companies.
Wm. W. Handy	Engineer	Apr. 22	Chief, Report-Appraisal Dept. Day & Zimmerman, Philadelphia.
Edward F. Burnett	Special Agent	Apr. 23	General Agent, Western Passenger Association.
Harry C. Kendall	Asst. Engineer	——	Electrical Engineer, Denver Tramways.
Geo. W. Remington	Asst. Engineer	——	Engineer, General Electric Co.

PROCEDURE FOR SURVEY

The first duty of a survey engineer is the notification of a district officer, shipyard executive and local transportation companies, by wire, of the impending survey; giving the name of the engineer in charge and assistants, with time of arrival.

The general information to be tabulated and collected by the engineer in charge prior to his start from headquarters follows:

1. Names and addresses of district officer, district supervisor, shipyard executive and local counsel of the Emergency Fleet Corporation.

2. Response to questionnaire sent in by the shipbuilding corporation, including maps and letter requested in questionnaire.

3. Report of district officer, or district supervisor, and any papers or data in file relevant to the passenger transportation situation at the yard in question.

Immediately upon his arrival on the ground the transportation engineer makes arrangements for establishing the local residence and business headquarters for transportation party. Preferably the working headquarters of the staff are in the shipyard or district office.

After the arrival of the survey party, calls are made upon the district officer and district supervisor where reasonably accessible, upon the official in charge of shipyard, and upon the general manager (or other available officer) in charge of each passenger transportation company serving the shipyard in question. The call upon the district officer and the district supervisor is of a general character, to develop possible high points of the general situation. The call upon the shipyard officials is prefaced with a general statement as to the pur-

pose of impending survey, and is intended to develop all facts relative to transportation deficiencies and possible means of relief; examination of any data collected by the shipyard, etc.

The data and information secured up to this point from the questionnaire, from personal conferences with shipyard officials and from independent observations of the survey party is then sifted, and the vital requirements for improvement of the local transportation situation are determined for use as a background for discussing various phases of the situation with the transportation companies.

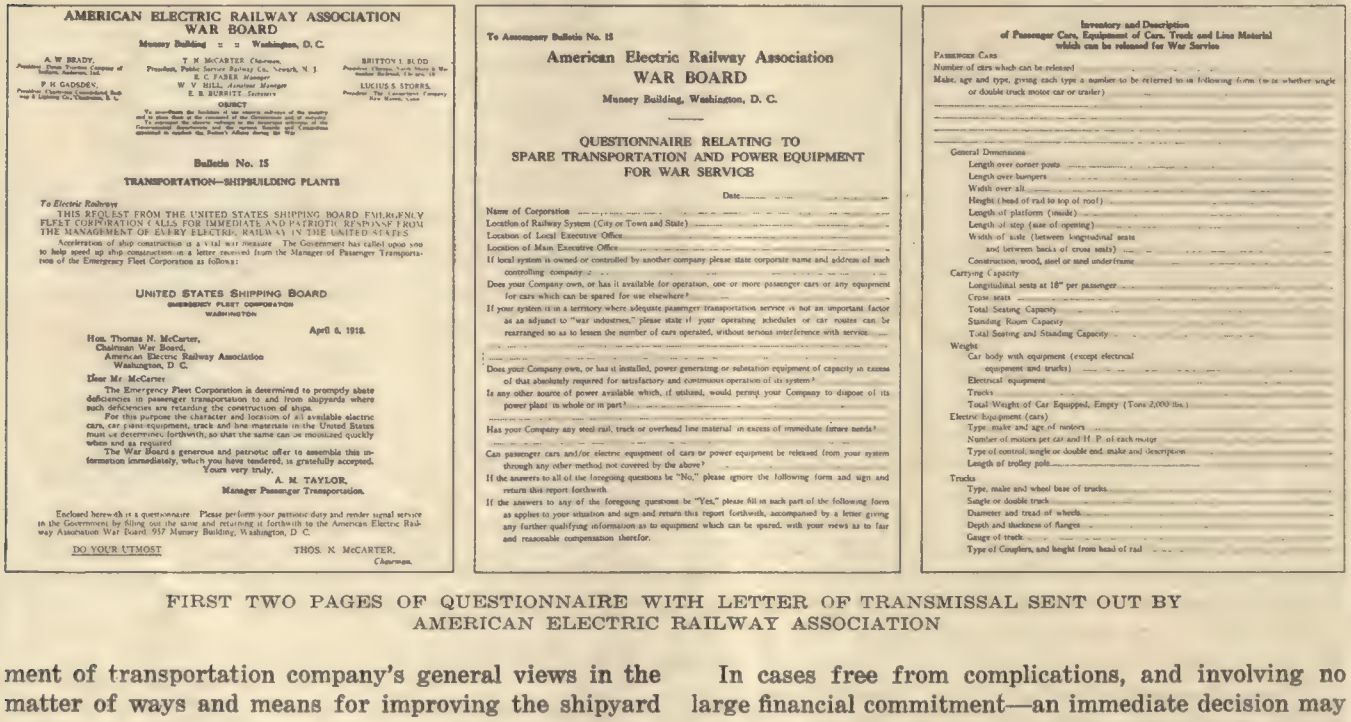
NEGOTIATIONS WITH LOCAL RAILWAY

The call upon the transportation company's executive officer is prefaced with a statement as to the purpose of the impending survey, followed by discussion of the local situation, as it affects the shipyard, and a development of transportation company's general views in the matter of ways and means for improving the shipyard service. A direct statement is presented as to the results which the Fleet Corporation is determined to get in the matter of adequate transportation facilities, the talk being shaped in such a way as to leave no doubt in the mind of the transportation company that immediate concrete results are what the Fleet Corporation requires and that it is prepared to give the transportation company whatever assistance may be essential—financial, or otherwise—to bring about the results required. Where undue loss will result to the transportation company, the Fleet Corporation is prepared will absorb such loss to secure essential results. The transportation company is also assured that any and all information supplied is confidential and for use solely in connection with the shipyard situation.

The chief of the party may also make a direct request for the whole-hearted patriotic co-operation of the transportation company, with arrangements to secure the undivided time and service, as and when needed, of the officers representing the traffic and transportation, track and roadway and statistical departments of the transportation company, in order to secure the required data and collateral information in the shortest time possible.

After the study and correlation by the survey party of facts and information resulting from a conference with the transportation company in connection with data gathered from shipyard sources, a set of preliminary recommedations is drawn up by the chief of the party on the vital elements of the situation.

The preliminary recommendations are utilized by the chief of the party as a background for a joint conference between the representative of the transportation companies and of the passenger transportation department, at which conference the district officer or district supervisor and local counsel of the Fleet Corporation are present, if practicable. A brief outline of the tentative plan so developed with recommendations is then telegraphed to the manager of transportation by the chief of the party, with his individual views and comments thereon and his recommendations.



AMERICAN ELECTRIC RAILWAY ASSOCIATION
WAR BOARD
Munsey Building :: Washington, D. C.

Bulletin No. 15

TRANSPORTATION—SHIPBUILDING PLANTS

To Electric Railways

THIS REQUEST FROM THE UNITED STATES SHIPPING BOARD EMERGENCY FLEET CORPORATION CALLS FOR IMMEDIATE AND PATRIOTIC RESPONSE FROM THE MANAGEMENT OF EVERY ELECTRIC RAILWAY IN THE UNITED STATES.

Acceleration of ship construction is a vital war measure. The Government has called upon you to help speed up ship construction in a letter received from the Manager of Passenger Transportation of the Emergency Fleet Corporation as follows:

UNITED STATES SHIPPING BOARD
EMERGENCY FLEET CORPORATION
WASHINGTON

April 6, 1918.

Hon. Thomas N. McCarter,
Chairman War Board,
American Electric Railway Association
Washington, D. C.

Dear Mr. McCarter:

The Emergency Fleet Corporation is determined to promptly abate deficiencies in passenger transportation to and from shipyards where such deficiencies are retarding the construction of ships.

For this purpose the character and location of all available electric cars, car piant equipment, track and line materials in the United States must be determined forthwith, so that the same can be mobilized quickly when and as required.

The War Board's generous and patriotic offer to assemble this information immediately, which you have tendered, is gratefully accepted.

Yours very truly,

A. M. TAYLOR,
Manager Passenger Transportation.

Enclosed herewith is a questionnaire. Please perform your patriotic duty and render signal service to the Government by filling out the same and returning it forthwith to the American Electric Railway Association War Board, 937 Munsey Building, Washington, D. C.

DO YOUR UTMOST

THOS. N. McCARTER,
Chairman.

To Accompany Bulletin No. 15

American Electric Railway Association
WAR BOARD
Munsey Building, Washington, D. C.

QUESTIONNAIRE RELATING TO
SPARE TRANSPORTATION AND POWER EQUIPMENT
FOR WAR SERVICE

Date.....

Name of Corporation .....
Location of Railway System (City or Town and State) .....
Location of Local Executive Office .....
Location of Main Executive Office .....
If local system is owned or controlled by another company please state corporate name and address of such controlling company .....
Does your Company own, or has it available for operation, one or more passenger cars or any equipment for cars which can be spared for use elsewhere? .....
If your system is in a territory where adequate passenger transportation service is not an important factor as an adjunct to "war industries," please state if your operating schedules or car routes can be rearranged so as to lessen the number of cars operated, without serious interference with service .....
Does your Company own, or has it installed, power generating or substation equipment of capacity in excess of that absolutely required for satisfactory and continuous operation of its system?
Is any other source of power available which, if utilized, would permit your Company to dispose of its power plant in whole or in part? .....
Has your Company any steel rail, track or overhead line material in excess of immediate future needs? .....
Can passenger cars and/or electric equipment of cars or power equipment be released from your system through any other method not covered by the above? .....
If the answers to all of the foregoing questions be "No," please ignore the following form and sign and return this report forthwith.
If the answers to any of the foregoing questions be "Yes," please fill in each part of the following form as applies to your situation and sign and return this report forthwith, accompanied by a letter giving any further qualifying information as to equipment which can be spared, with your views as to fair and reasonable compensation therefor.

Inventory and Description
of Passenger Cars, Equipment of Cars, Track and Line Material
which can be released for War Service

PASSENGER CARS
Number of cars which can be released .....
Make, age and type, giving each type a number to be referred to in following form (state whether single or double truck motor car or trailer) .....

General Dimensions
Length over corner posts .....
Length over bumpers .....
Width over all .....
Height (head of rail to top of roof) .....
Length of platform (inside) .....
Length of step (size of opening) .....
Width of aisle (between longitudinal seats and between backs of cross seats) .....
Construction, wood, steel or steel underframe .....
Carrying Capacity
Longitudinal seats at 18" per passenger .....
Cross seats .....
Total Seating Capacity .....
Standing Room Capacity .....
Total Seating and Standing Capacity .....
Weight
Car body with equipment (except electrical equipment and trucks) .....
Electrical equipment .....
Trucks .....
Total Weight of Car Equipped, Empty (Tons 2,000 lbs.) .....
Electric Equipment (cars)
Type, make and age of motors .....
Number of motors per car and H. P. of each motor .....
Type of control, single or double end, make and description .....
Length of trolley pole .....
Trucks
Type, make and wheel base of trucks .....
Single or double truck .....
Diameter and tread of wheels .....
Depth and thickness of flanges .....
Gauge of track .....
Type of Couplers, and height from head of rail .....

FIRST TWO PAGES OF QUESTIONNAIRE WITH LETTER OF TRANSMISSAL SENT OUT BY AMERICAN ELECTRIC RAILWAY ASSOCIATION

In cases free from complications, and involving no large financial commitment—an immediate decision may be telegraphed by the manager of transportation. In no case are final commitments made, involving expenditure of money by the Emergency Fleet Corporation, however, except on the authority of the manager of transportation.

If possible, the local counsel of the Emergency Fleet Corporation draws up a tentative form of contract covering the provision of additional transportation facilities for shipyard service, developed as necessary by the joint conference mentioned.

The formal report governing various phases of the local situation investigated and giving specific recommendations of the engineer in charge is prepared at headquarters and is transmitted to the manager of transportation for his approval, so that the office records may be kept in suitable form.

Where there is considerable opposition to the proposed plan or to required changes or additions on the part of the transportation company, immediate conference is arranged between the manager of passenger transportation and the executive officials of the transportation company to develop an agreement covering

construction, equipment, operation and any arrangements as to financial aid to be afforded by the Fleet Corporation.

A formal contract is then prepared by general counsel, embodying the terms of the agreement with the transportation companies.

The foregoing general outline may be supplemented by the following details:

THE DETAILED INFORMATION DESIRED

The detailed information compiled by the transportation engineer in charge of the survey naturally groups itself into two divisions, namely, that relating to the needs and that relating to the means available for supplying those needs. The work of collecting the data then proceeds along the following lines after the call on the shipyard officials:

1. General checking over of questionnaire and information sent in by shipyard to develop explanation of points brought out therein and additional points generally resulting from discussion.

and from district in which it is located, as to origin, destination and routes. Where shipyard has not supplied data as to destination of employees, secure approximation either from company or passenger count where necessary only.

5. Detailed and specific consideration and study of features of transportation facilities developed by the questionnaire, as needing correction.

6. Development of a general line of recommendations enumerating in some detail additional facilities to be provided, as:

Cars: New equipment.
Rehabilitation of existing equipment.
Possibility of borrowing from nearby lines.
Track: Laying of second track.
Sidings and terminal loops.
Construction of new lines.
Rehabilitation of existing lines.
Possible Re-routing: and reduction in number of cars operating on routes not serving shipyard and transference to shipyard routes.
Tripper Service: or Special Train Service—
Number, type and capacity of cars.
Headway, schedules, etc.

DATA OF TRANSPORTATION FACILITIES

1. Complete map of street railway system or systems, showing:

(a) Routes serving shipyard without change of cars and



QUESTIONNAIRE SENT BY EMERGENCY FLEET CORPORATION TO SHIPYARDS ASKING FOR INFORMATION AS REGARDS TRANSPORTATION FACILITIES

2. Secure map, or prepare sketch map of shipyard property, upon which may be indicated information of the following character:

(a) Location of entrance and exit gates to yard.

(b) Important streets in the vicinity of yard, with character of paving and transportation lines thereon.

(c) Availability of nearby sites for sidings or terminal loops, if such are needed, ownership thereof and probable cost; noting also the character of existing structures located thereon, or if any additional structures are proposed.

(d) Character of adjacent territory, the degree of development for residential purposes, areas available for new dwellings, and kind of industries in the neighborhood. General description of dwellings, within, say about 1 mile, and possibilities for utilizing same to a greater extent, in order to relieve the transportation system. Opportunities for new dwelling construction within walking distance of the plant, and capacity of such new accommodations, as well as capacity of existing accommodations. Note whether high or low ground, and other features affecting living conditions, whether good or bad.

3. Take or obtain photographs of all conditions directly bearing upon deficiencies in passenger transportation facilities and illustrating recommended transportation facilities, as, for instance, photographs of proposed sites for terminal loops, different types of cars in shipyard service, typical track construction and condition, and photograph of any seriously overloaded cars during the rush-hour period.

4. Rough check of traffic flow to and from yard and to routes serving shipyard with one transfer differentiated from rest of system.

(b) Industrial and commercial districts served, with notation as to character and extent thereof with respect to transportation facilities required.

(c) Fare and time zones.

(d) Indication of heavy grades, if any, and maximum grade.

(e) Grade crossings with steam railroads and drawbridges, with notations as to delays occasioned thereby, importance of draws.

(f) Ownership and probable cost of land which will, or may be, required for extensions to existing lines, terminal loops, sidings, etc. Have any improvements been projected thereon?

2. Inventory by types and capacities of total cars operated, with proportion of such cars serving the various districts through which the company operates.

3. Number of cars operated on routes serving shipyard:

(a) During morning and evening rush hours and off-peak periods, by types and capacities.

(b) Headway during morning and evening rush hours and off-peak periods.

(c) Number of cars, by types and capacities, used in tripper service for shipyards and adjacent plants.

(d) Approximate number of stops per mile.

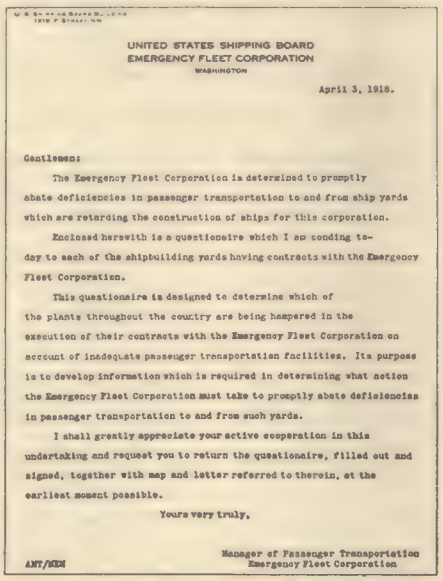
(e) Essential railway operating statistics by routes, insofar as they are related to shipyard situations.

(f) Platform labor situation—union or non-union; diffi-

culty of securing and retaining platform labor, etc. Extra compensation for rush-hour service. Where platform labor situation warrants, careful consideration should be given to possibility of utilizing shipyard employees to operate trippers in rush-hour service. Attitude of motormen and conductors toward such utilization; regulation of transportation company respecting same as to necessary qualifications of men. In such cases also responsibility of shipyard employee to railway company during the performance of his platform duties should be clearly specified as should also the responsibility of the company for such employee's action during such time as he is working for the transportation company.

4. Lines serving shipyard and adjacent districts, with turn-outs—Full data should be secured as to distance between and length of turn-outs available for car storage, headway, and schedules in both directions, with notations as to extent of delays in turn-outs morning and evening.

5. Report should be obtained from company's chief engineer, or similar technical official, concerning power house, substation and line capacities, and present maximum demands on power house, substations and various lines. These data need be approximate only, their purpose being to furnish some indication of the extent of spare capacity, if any, and degree of overloading, if such conditions exist. Notations should be made as to source of power—hydro-electric or steam—generated by company or purchased. Engineer's report should also give the number of cars in operation during maximum station peak, average kw.-hours consumption per car mile or per ton mile, during winter and summer periods, and information along similar lines. Typical station load curves for different seasons of the year should also be obtained.



UNITED STATES SHIPPING BOARD
EMERGENCY FLEET CORPORATION
WASHINGTON

April 3, 1918.

Gentlemen:

The Emergency Fleet Corporation is determined to promptly abate deficiencies in passenger transportation to and from ship yards which are retarding the construction of ships for this corporation.

Enclosed herewith is a questionaire which I am sending today to each of the shipbuilding yards having contracts with the Emergency Fleet Corporation.

This questionaire is designed to determine which of the plants throughout the country are being hampered in the execution of their contracts with the Emergency Fleet Corporation on account of inadequate passenger transportation facilities. Its purpose is to develop information which is required in determining what action the Emergency Fleet Corporation must take to promptly abate deficiencies in passenger transportation to and from such yards.

I shall greatly appreciate your active cooperation in this undertaking and request you to return the questionaire, filled out and signed, together with map and letter referred to therein, at the earliest moment possible.

Yours very truly,

Manager of Passenger Transportation
Emergency Fleet Corporation

ANT/KEH

LETTER OF TRANSMISSAL SENT WITH QUESTIONNAIRE BY EMERGENCY FLEET CORPORATION TO SHIPYARDS

6. Availability of additional sources of power supply, and steps necessary to utilize such sources, if needed.

7. Record of car break-downs on a line, or lines, serving districts, if of frequent occurrence, should be obtained; also general report from the master mechanic of the company covering the physical condition of cars, extent and cost of repairs needed to place the cars in good condition, with notations as to car repair ship and carhouse facilities.

8. New or second-hand cars, car equipment, power plant equipment on order, if any; giving capacity and general description, probable delivery date and name and address of manufacturer or vendor.

9. Where conditions would warrant such a step, careful consideration should be given to the possibility of staggering the transportation load as between plants, and within the shipyard plant itself, and by short stopping and starting cars. (Consider rulings on wage and labor conditions by the Shipbuilding Labor Adjustment Board.) In connection with this a note should be made of non-essential industries in the shipyard district which draw upon the transportation facilities to any material extent.

10. Report from engineer of maintenance-of-way, or corresponding official, covering physical condition of track and roadway, bridges and trestles, etc., with extent and cost of repairs needed to place track in good operating condition.

11. General statement from company covering the following:

(a) Its independent recommendations as to what steps should be taken to provide adequate and satisfactory service to the shipyards, and the reason, or reasons, why each step has not been taken, or the obstacles which have, or are, retarding improvement in service, have not been removed.

(b) Estimate of cost in some detail for effecting the desired improvement.

(c) Outline of company's plans for handling additional traffic resulting from shipyard growth, with an estimate of new equipment which would be needed and the probable cost thereof.

(d) Financial position of company, specifying difficulties in the matter of new financing, maturing obligations, etc., and giving its views as to character and extent of financial assistance which was to be rendered by Emergency Fleet Corporation.

(e) Consideration of water transportation facilities in detail.

12. Investigation of feasibility of auto-bus routes. Make notations covering the following points:

(a) *Character of Road:*
- Foundation and surface, and present condition.
- Cross-section of road—crowning, etc.
- Limiting height of overhead obstructions. (This fixes generally the character and type of bus.)
- Width of roadway (maximum)
- By whom maintained (State, town or county; name, title and address of responsible official in charge thereof.)
- Extent of necessary repairs for bus line traffic.
- Determination of most feasible city streets for routes.

(b) *Character of Territory:*
- General.
- Railroad or electric railway crossings.
- Cities, boroughs and towns passed through; name, title and address of head official of each.
- Character and extent of vehicular traffic which now uses road.
- Sites for garages and shops.

(c) *Character of Traffic Which Would Use Busses:*
- General.
- Extent of—total, and shipyard traffic.
- Distribution of traffic as to time.
- Probable stops per mile.
- Possibility of routing busses so as to pick up ex-rush hour traffic.

13. Expediting provision of required additional facilities:

(a) Plans and specifications to be prepared by company immediately upon consummation of plans.

(b) Execution of necessary local ordinances and permits, compliance with regulations of Public Service Commissions, etc. Quick action required as a war measure.

(c) Complete schedules of requirements of material and equipment, as to specifications and quantities to be submitted to Manager of Transportation by company.

(d) Take up with Priority Board and complete arrangements for source of supply.

(e) Close contracts with manufacturers.

(f) Follow up shop construction and deliveries.

(g) Coincident with (a) to (f) above, follow up and see that agreed upon operating improvements are being worked out and put into effect.

(h) Field observations from time to time to determine the extent to which additional facilities and changes in operation have abated deficiencies in transportation.

ENCOURAGING PROGRESS ALREADY MADE

In accordance with the procedure outlined engineers of the Passenger Transportation Service Section have already surveyed the needs at the larger Eastern yards such as Chester, Newark Bay and Baltimore. Up to April 26, all the shipyards at Beaumont, Savannah, Houston, Brunswick, Jacksonville, Everett and Bellingham had reported satisfactory transportation conditions as had also at least part of the builders at Mobile, Wass Point, Madisonville, Orange and Pascagoula.

In general the conditions on the Pacific Coast are satisfactory except that more electric service could be used at Seattle.

The Newport News & Hampton Electric Railway is building a 3 to 4 mile extension north of Newport News to a new housing development. The Shipping Board has advanced the money for the line and for the purchase of ten cars.

At Oakland, the Key Route is to be extended ½ mile to the Moore shipbuilding plant. At this location also

service has been improved by closing the drawbridge between Alameda and Oakland.

As noted in the case of Camden, the section is prepared to use either steam or electric transportation. While it has no commandeering powers over inter-state steam lines, it works in close harmony with the Director-General of Railroads. Thus in a recent case, the latter extended a morning and evening service of twenty-six passenger coaches as soon as the needs were put before him.

Ships may be used, as at New London, where a ferry has been installed for service to the Bath Iron Works. To date, however, it has not been found necessary to use motor trucks or buses.

Co-operation with Public Service

In the Southern division of the Public Service Railway arrangements have been made with the railway for thirty-three new cars in addition to those assigned from regular service, for the purpose of serving the Gloucester and Camden shipyards. Suitable power plant, transmission and substation equipment will be added by the electric company to provide power for these cars. Additional shop and car storage facilities will also be provided. The Fleet Corporation will finance these improvements at a cost of $1,200,000, the Public Service Corporation paying 5 per cent interest annually on the total cost. The contract runs until after the war. At the time of the discontinuance of service the company will buy certain portions of the equipment as agreed upon at an appraisal value to be fixed by a board of arbitrators. Of the total expenditure about one-half is for increasing the power facilities. The cost would have been more but for the provision for operation in such a way as to flatten the load peaks.

In the vicinity of Newark the Fleet Corporation has an arrangement with the railway for 2-mile double-track extension across the meadows crossing the Jersey Central tracks, at the Oak Island freight yard, on a long viaduct to be built by the steam railroad and the city of Newark. The Fleet Corporation will pay the bills for this work and also will cross-connect the extension with the neighboring city lines by means of a connecting track on Gotthart Street and Avenue R. Involved in this improvement also is the purchase of eighteen cars, and the service will be sufficient to care for one-half the employees of the Submarine Boat Corporation. The cost will be about $800,000.

In the Southern Division Mr. Taylor has arranged for an equitable division of traffic among the steam and electric lines, for the staggering of the opening and closing hours in the shipyards and for assistance from the shipbuilders for operating cars during rush hours. The shipyards will furnish one-half the number of men required to run trippers, the railway to pay standard platform wages. Similar arrangements will probably be made also elsewhere on the Public Service property.

It is expected that within ninety days the transportation facilities will have been increased to meet the anticipated demands upon them and that it will be easily possible to expand them as required.

In all of these improvements the railway will have the hearty co-operation of the department in introducing the most efficient methods of operation. For instance, prepayment areas have already been introduced at the Camden and Gloucester shipyards by means of fenced loops. The plans contemplate the provision of such prepayment stations at other congested loading points.

Shipping Board's Transportation Service Capable of Handling All Electric Railway Matters

The scope of the Passenger Transportation Service Section is really much broader than to supply service to the shipyards themselves. Its job is to speed up shipbuilding just as much in the production of what goes in the hull as in the building of the hull itself. Thus, it is almost impossible to foresee the inland ramifications that may develop. For example there is the Westinghouse plant at Essington near Philadelphia where 5000 men will be making steam turbines for the Emergency Fleet Corporation's ships. Arrangements must be made to transport these men expeditiously although they are not actually in shipyard service.

With the constantly growing degree of co-ordination between the different Government departments it is to be hoped that the efforts in local transportation and housing will be concentrated to avoid duplication of effort and mutual interference. As the department organized by the Shipping Board is the only one composed specifically of electric railway specialists, it is the logical body for this important purpose. The knowledge and vigor it has already displayed gives good promise that the electric railway will play a deservedly big part in the winning of the war.

Making an Electric Railway "Tank"



THE accompanying illustration shows how the Berkshire Street Railway, Pittsfield, Mass., has camouflaged a single-truck car as a "tank." This car has been doing great work in the Liberty Loan campaign at North Adams and other towns in Northern Berkshire. The tank was designed by W. W. Richmond, treasurer Hoosac Savings Bank, North Adams.

The North Staffordshire (England) Railway has constructed for local use a 17-ton storage-battery locomotive. It is driven by two series motors rated at 41 hp. at 250 volts. The battery weighs about 6½ tons and has a one-hour discharge rate of 150 amp. The locomotive is capable of hauling a 90-ton load at 10 m.p.h. on the level, or 72 tons at 11 m.p.h.

New Flash Suppressor Applied on the St. Paul

Addition of Collector Rings to Direct-Current Generator Permits Making of Alternating-Current Short-Circuit, Limiting Internal Disturbances to Armature Windings

BY N. W. STORER AND F. T. HAGUE
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

A DEVICE for preventing flashing, known as the "flash suppressor," which differs radically in its theory of operation from all circuit opening or reactance inserting devices, has recently been successfully developed. It functions to protect the machine from injuring itself when its current output exceeds a predetermined value. The device is being installed by the Westinghouse Electric & Manufacturing Company in the 3000-volt substations of the Chicago, Milwaukee & St. Paul Railway.

The flash suppressor consists of a set of small contactors, arranged to short-circuit the armature windings of the direct-current generator through three collector rings, connected in three-phase relation. This device is actuated and tripped in a manner similar to that of the circuit breaker, but with this difference—the contacts, which carry current only momentarily when the device operates, are very small and light, and have normally but a short distance to travel. It differs also, in that this device closes a circuit while a circuit breaker opens one and must, therefore, quench the arc before it can completely rupture the circuit.

To secure operation equally as rapid as that of a high-speed circuit breaker, only a relatively simple mechanism is required, and it is not difficult to secure a much higher speed without complication. The contactor can easily be made to close in from 0.006 to 0.008 second, which is amply fast to prevent a flash from spreading on any but the higher frequency machines.

THE FLASH SUPPRESSOR APPLIES A RADICAL REMEDY

The flash suppressor performs a double function—first, closing a short-circuit on the collector rings, which simultaneously reduces the voltage between commutator bars practically to zero. If the voltage per coil were the same throughout the winding, this short-circuit would reduce the voltage between all bars to zero; but owing to the locations of the various coils with respect to the poles, their voltages differ and there will be small voltages remaining between some commutator bars; not enough, however, to support an arc. Consequently, if flashing has not started when the contactor closes, it will not start; and, if it has started, it is instantly suppressed.

The second function of the flash suppressor consists in cutting down the field flux. A short-circuit through the collector rings causes a large wattless current to flow through the armature windings whose magnetizing force opposes that of the field and cuts down the voltage at the maximum safe rate, without opening either field or armature circuit.

It will thus be seen that the stored energy, not only of the line but of the machine itself, is harmlessly short-circuited through the machine and dissipated in the armature and field windings. The direct-current circuit breaker at the switchboard will be opened automatically, but only after the flash suppressor has done its work and then, of course, the voltage is reduced practically to zero. The use of the flash suppressor, therefore, not only eliminates the danger to the machine from flashing, but also obviates the necessity for opening the extremely heavy short-circuit currents with the circuit breaker, and the attendant surges in the line. In other words, the fire-works are eliminated from the substation.

WHAT THE OSCILLOGRAMS SHOWED

During the development of this method of suppressing flashing, a large number of tests were made on machines of different types and characteristics. The following tests are representative and apply to the type of generator generally used in high voltage direct-current railway service. Oscillograph records have been taken which portray the characteristics of direct-current generators on extreme overloads and the changes in these characteristics which are brought about by the application of the flash suppressor. The direct-current generator used in these tests was a 1000-kw., 650-volt, 750-r.p.m. machine. It embodies no unusual design features not standard with railway generators that would tend to give it unusual momentary overload capacity.

On the limiting overload which the machine would stand without flashing the armature current rose to a constant value of 13,000 amp., or about eight times full load current. The total circuit resistance measured 0.0287 ohm, and the actual current obtained was 57 per cent of the theoretical current that would be obtained by dividing the terminal voltage by the circuit resistaance. The initial rate of current increase was about 2500 amp. per 0.001 second, and the current rose to 95 per cent of its final value in the first 0.010 second.

The shunt field current underwent a sudden increase in value, which is characteristic, even of compensated generators, when a suddenly applied overload or a partial flash occurs. The increase of field current to 2.5 times normal value was due to flux distortions, the demagnetizing action of local currents in the commutated armature coils, and possibly to some of the commutator bars being short-circuited by the partial flashover.

In the next test the flash suppressor was adjusted for short-circuiting the alternating-current side 0.0006 second after the direct-current side. Both short-circuits were made at 650 volts without resistance or reactance of any kind in the circuit. The premises outlined in the foregoing theory were completely borne out, as the flash at the commutator at the time of direct-current short-circuit was confined to a small explosive puff of ex-

tremely short duration which did not damage either brushholders or commutator surface. Many duplicate oscillograph records of combined short-circuits were made which established that the suppression of flashing is entirely independent of the point of the alternating voltage wave at which the short-circuit occurs, and that all armature positions give essentially the same effect. By means of the oscillograph record the delay of the alternating-short-circuit behind the direct-current short-circut can be very accurately measured.

Since the use of the flash suppressor involves short-circuiting the alternating-current side of a generator a few thousandths of a second after a direct-current overload is applied, it is of interest to know the magnitude of the alternating current flowing when the collector rings are short-circuited upon themselves. The current flowing when the alternating-current side of the machine is short-circuited is very materially less than the current flowing when the direct-current side is short-circuited, since the winding resistance is the principal limiting factor at time of direct-current short-circuit, while the winding reactance imposes greater limitation on the alternating-current short-circuit. Moreover, the polyphase reactance of the armature winding is nearly twice as great as the reactance of an alternator of equal rating, because of the large number of turns required for a given voltage in order to avoid an excessive average voltage between commutator bars.

SHORT-CIRCUITING THE COLLECTOR RINGS "KILLS" THE DIRECT CURRENT

Oscillograms of the alternating currents indicate that the resultant current rises uniformly in magnitude until it reaches its maximum value in approximately 0.0014 second (one-half cycle) after the instant of application of the alternating-current short-circuit. It is an inherent condition of any polyphase short-circuit that the resultant armature currents attain their maximum magnitude after one alternation from the instant of short-circuit. The armature current and field have very unusual characteristics under combined alternating and direct-current short-circuit conditions. The oscillograms referred to earlier show that the direct-current begins to increase at the uniform rate of about 2500 amp. per 0.001 second, and in 0.006 second reaches a value of 14,000 amp. The application of the collector ring short-circuit immediately arrests any further increase of direct current, and in the next 0.014 second (one-half cycle) the direct current is steadily decreased until it drops to practically zero. The large decrease of the direct-current in the 0.014 second following the application of the alternating short-circuit, i. e., the time required for the alternating short-circuit to attain its maximum value, is due to the well-known fact that an armature winding can deliver only a definite current on short-circuit. This current is limited by the electrical constants of the armature winding and is not affected by the number of points at which a short-circuit is applied to the winding. This simply means that the transient short-circuit current output from the collector side is subtracted directly from the direct-current output and the decrease of direct current corresponds exactly to the building up of the alternating short-circuit current. On each successive machine alternation, the direct current pulsates to a maximum and minimum value of steadily decreasing magnitude. The direct current finally settles to a constant value of about 7000 amp. (4.5 times full load) in about 0.075 second.

In case of a direct-current short-circuit through a relatively low resistance the direct current rose only to 57 per cent of the theoretical value obtained by dividing the terminal voltage by the total circuit resistance. In another test where the direct current reached an almost constant value before the flash suppressor was actuated, the current only reached 30 per cent of its theoretical short-circuit value. Extensive tests have shown that high-speed compensated generators will deliver twelve to fifteen times full-load current on direct short-circuit (including the current in the flash-over). This short-circuit is about 25 to 30 per cent of the theoretical short-circuit current based upon the circuit resistance, including brush contact.

The characteristic curves of the various currents are not materially changed, as the time of the alternating short-circuit is further delayed after the direct-current short-circuit is applied. One oscillogram taken in these tests shows the alternating-current short-circuit delayed 0.011 second after the direct-current and this condition was mainly evidenced in operation by a slight increase in the explosive puff of the arc blowing itself out, before it had time to do any damage. The direct current in this case rose to about 19,000 amp., or twelve times full load, while the field current did not rise as high as when the delay of the alternating-current short-circuit was less.

These tests were made on the machine as a separately excited shunt generator, as this is the most favorable condition for operation of railway generators which are required to function on regenerated load. In order to establish the operating characteristics of a compound-wound machine, the series field was connected in circuit. In one test on a compound machine the alternating-current short-circuit was delayed 0.010 second. The maximum value of the direct current was not changed by the addition of the series field, nor was its characteristic oscillation reduced. The shunt field current was affected very considerably, due to the series field magnetization discharging through the shunt field circuit in the period before the alternating-current short-circuit is applied. The operation of the machine was not materially different as regards the volume of flash from a short-circuit, under the same conditions, as a shunt generator.

The characteristics of the direct-current wave show clearly wherein the merits of the flash suppressor lie. The application of the alternating-current short-circuit not only arrests the increase of current feeding into the direct-current short-circuit, but it actually suppresses this current to practically zero for an instant. This characteristic, in conjunction with the reduction of the voltage between commutator bars, effectually snuffs out any are that has been started by the direct current before the alternating-current short-circuit is applied. The direct current rises to a sufficient value to flash, but it is removed by the alternating-current short-circuit long before a bar can pass from one brush arm to the next, and the flash which actually gets started is summarily suppressed.

The value to which the shunt field current rises is

an accurate measure of the rate at which the main field flux is reduced, and also of the voltage induced in the shunt field coils during the period of short-circuit. An inspection of the field current curve showed that the maximum current is only seven times the normal full load, so that the voltage induced in the shunt field coils is six times the excitation voltage. High-voltage railway generators are invariably separately excited at some low voltage, such as 125 volts, (of which one-half is normally consumed in field rheostat) so that an induced field voltage of six times normal is a negligible increase on field coils which are normally designed to withstand a much higher voltage.

The tests which have been described are only typical of a large number that were made during the development of the flash suppressor. All of these tests, on machines of widely different characteristics, point to the fact that in the flash suppressor has been found a real and positive preventive of flashing of direct current railway generators.

It has been designed directly to attack the cause of flashing and suppress it rather than to minimize the liability of flashing or to mitigate its effect more or less completely.

Illinois Governor Uses I. T. S. Private Car

The private car of H. E. Chubbuck, vice-president executive of the Illinois Traction System, was used to convey Governor Frank O. Lowden and a party of state officials from Springfield, Ill., to Peoria, Ill., to attend the funeral of William H. Stead, formerly attorney-general of Illinois and a member of Governor Lowden's cabinet at the time of his death. The run was made in exactly two hours.

The private car had the right-of-way, the trip being planned to meet cars bound in the opposite direction with a minimum of delay.

McAdoo Travels via Electric

North Shore Line Carries Secretary of Treasury and His Party on Successful Excursion to Great Lakes Naval Training Station

ONE of the important features of the Liberty Loan visit of William J. McAdoo, Secretary of the Treasury, to Chicago on April 28 and 29 was a trip to the Naval Training Station at Great Lakes, Ill., *via* the Chicago, North Shore & Milwaukee Railroad. This is a high-speed electric line, under the management of Britton I. Budd, president Chicago Elevated Railroad.

The party consisted of Secretary and Mrs. McAdoo, F. B. McDougal, Director of the Federal Reserve Bank; General Barry, commanding Central District, U. S. A.; Colonel McChesney, U. S. A.; H. C. Merrick, president National Security League; Charles W. Folds, H. L. Stuart and E. K. Boisot of the Liberty Loan Committee; Captain W. A. Moffett, U. S. N., Commandant Great Lakes Station; Commander James Wilson, U. S. N., and Lieutenant-Commander Isbesten, U. S. N.



MR. AND MRS. McADOO BOARDING THE McADOO SPECIAL AT GREAT LAKES

The trip was personally supervised by Mr. Budd. The train included one combination dining and parlor car and one coach. The train left the Congress Street Station on the elevated lines at 8.30 a. m. and went over the elevated tracks to Evanston, thence over the North Shore Line to Great Lakes. A delicious breakfast was served to twenty-eight persons en route.

At Great Lakes the visitors were driven in automobiles through the big training station, and Secretary McAdoo addressed and reviewed five battalions of Jackies. The special train left at 11.30 and made the return trip of 35 miles in one hour to Chicago. Without the electric line the trip might have been impossible, owing to the limited amount of time at the Secretary's disposal. The trip was similar to that made by Secretary of the Navy Daniels over the same line on April 10, as noted in the ELECTRIC RAILWAY JOURNAL of April 20.

Insulated Negative Return Feeder System Satisfactory at Lynchburg, Va.

American Railways Designs Simple System for Local Situation and Brings Return Drop Within Easy Control—The Author Explains How the Data for Selecting Feeder Sizes Were Obtained

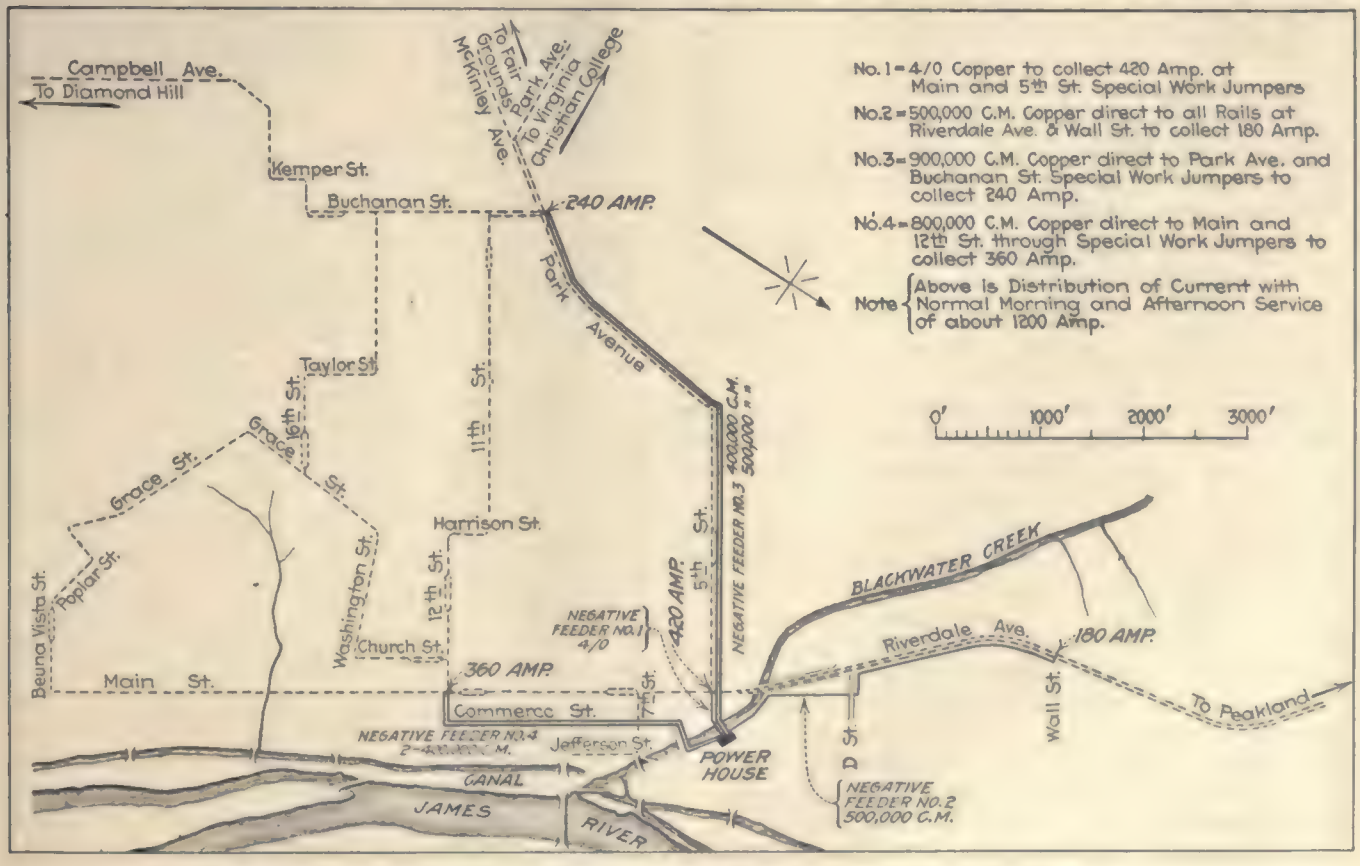
BY A. P. WAY
Electrical Engineer, American Railways Company, Philadelphia, Pa.

FOR two years to date there has been in continuous operation at Lynchburg, Va., an insulated negative feeder system which has satisfactorily met all expectations. It was installed to prevent electrolysis from stray currents, and the management decided to apply this remedy to the cause rather than the effect of the difficulty; in other words, to prevent current from leaving the tracks rather than to endeavor to prevent damage to underground structures after current had been forced or induced to flow in them. The insulated negative feeder system which reduces the over-all potential drops in tracks appeared to be the best method for Lynchburg, but it must be understood that a successful remedy for one railway system is by no means a solution for all.

Previously there had been no negative feeders supplementing the rails. The entire return current was collected from the tracks through a total of 1,500,000 circ. mil of cables at the corner of Fifth and Main Streets, the point nearest to the power house, about 800 ft. distant. Electrolysis effects were actually concentrated at this point, except at a point directly in front of the power house there was some trouble where the cables were connected to old rails in the earth. This latter condition was remedied by insulating the feeders from the earth at the power house end.

The entire track bonding was in particularly good condition except at some points where jumpers around special work were not good, but these were soon repaired. In view of the fact that the over-all voltage drop over tracks between given points provides the potential which forces current through parallel circuits in earth, etc., it was decided to reduce these over-all voltages by removing some of the current from the rails by overhead feeders at a number of points in different directions beyond Fifth and Main Streets.

To determine the distribution of the load two maps were made showing the location of all cars at a particular moment during normal operation early in the afternoon and at 5.30 p. m. during the peak-load period.



SKETCH MAP SHOWING RETURN FEEDERS INSTALLED AT LYNCHBURG, VA

The watt-hour meters at the power house were read every fifteen minutes, and the average load was thus determined for periods of fifteen or thirty minutes, one, eighteen or twenty-four hours. From these it was found that the average current per car was as follows:

One hour normal period, 55 amp.; one hour peak period, 51 amp.; fifteen minute peak period, 68 amp.

The layout was designed to make an over-all voltage drop of 0.5 volt per 1000 ft. of track during the normal period, with a one hour average station load of 1150 amp. This made about 0.85 volt during maximum fifteen-minute peak. This further made an average maximum one-hour drop of 0.64 volt and average twenty-four-hour drop of only 0.38 volt per 1000 ft. of track. To be sure, there are larger momentary voltage drops that would be shown by an indicating voltmeter, but momentary maximum voltage swings are no more productive of electrolytic corrosion than would a momentary maximum charging current be effective in charging a battery.

By referring to the accompanying map it will be seen the most economical points from which to collect current were at track intersections allowing small current density in diverging tracks beyond. Feeders were run to Fifth and Main, Twelfth and Main, Buchanan and Park, and Rivermont near Wall. Just enough current was allowed to flow in the tracks between these points and Fifth and Main to keep the drop within 0.5 volt per 1000 ft. of track during normal service, and the feeders were designed of such cross-section as to carry back to the plant the excess current delivered to tracks beyond these points.

For example, 480 amp. originated beyond Twelfth and Main, while the track between this point and Fifth and Main should have carried only 120 amp. to produce the allowable drop. Consequently 350 amp. had to be carried by a feeder. Similarly 360 amp. originated beyond Buchanan and Park, while the track would carry about 120 amp., leaving 240 amp. for a feeder, and the conditions were similar for the other feeder. This left about 420 amp. to be collected from the tracks at Fifth and Main, including the local load.

Feeder Sizes Were Determined By Resistance Needed to Produce Desired Voltage Drop

The cross-sections of cables were determined as follows: A No. 0000 cable was provided to carry the 420 amp. from Fifth and Main Streets with a drop of about 15 volts. Adding to this the drop in the track on Main from Fifth to Twelfth Streets, due to the local current and the 120 amp. originating beyond Twelfth Street and not carried by feeder, we have approximately 18 volts from Twelfth and Main to the power house. This will be the drop in the feeder from Twelfth and Main. Knowing the length, drop and current carried in the cable its cross-section was determined to be approximately 800,000 circ.mil. Similarly the cable to Buchanan and Park Streets had to be 900,000 circ.mil. and the cable to Rivermont and Wall 500,000 circ.mil. In this way no resistance was needed other than that in the feeders. When the cables were installed the current distributed itself very closely in accordance with the calculated values.

No elaborate tests were made after the installation as experience with a similar installation elsewhere had shown that the voltages between underground structures and rails were reduced to satisfactory values. In that the earth resistance was the same, the reduction of stray current would be directly proportional to the reduction of these voltages. The results of the following two years the installation give the conclusive proof of its success.

How Electric Lines Can Help

Secretary McAdoo Disclaims Present Intention to Take Over Electric Railways, but Asks for Co-operation in Freight Hauling

ON HIS recent trip to the Great Lakes Naval Training Station, as noted in another column, Secretary of the Treasury McAdoo expressed to a representative of this journal his views in regard to the status of electric railways.

Secretary McAdoo said that there is no present intention of taking over these properties, for local conditions are such that government operation would be extremely difficult and in most cases not feasible.

The government desires, however, to co-ordinate the electric lines so as to promote the highest degree of coöperation with the steam roads. Mr. McAdoo believes that the electric lines are an important factor in the transportation field, and that it is highly desirable to develop electric railway freight-handling facilities in territories which are not reached by steam roads, where the steam carriers need relief or where a better and more economical service can be rendered by the electric lines.

Speaking of the Liberty Loan, Mr. McAdoo said the spirit of the people throughout the country is inspiring, and that a greater enthusiasm for the Third Loan is being shown than for either of the foregoing issues. The statement that the West does not realize the seriousness of this war is without foundation. On Mr. McAdoo's Western trip the people turned out at any and all hours to hear him speak.

Publishers Criticise Zone Law

AT A MEETING of the Periodical Publishers' Association, held in New York on April 26 to consider the postal "zone" law, a resolution was adopted unanimously condemning this law and urging Congress to postpone it until after the war. As Allan H. Richardson, president of the Periodical Publishers' Association, pointed out, the publishing industry is today laboring under all the difficulties which were described at the publishers' hearings last fall, and in addition the difficulty of increased costs, far beyond anything which was foreseen at the time of those hearings. Moreover, the industry is rendering incalculable service to the government, and it is more essential, than ever before, that it should be kept wholly intact and should be spared any unnecessary burdens. The resolution follows:

Whereas, the increased second-class postage rates, as provided in Section 3 of the Act of Congress, approved Oct. 3, 1917, which becomes effective July 1, 1918, will be most unfair and oppressive to the periodicals of the country and the reading public,

Now, therefore, be it resolved, by the Periodical Publishers' Association of America, that Congress be urgently requested to suspend the provisions of said law, insofar as they apply to increased second-class postage rates, until one year after the close of the present war.

How Various Types of Special Work Layouts Have Been Developed in Brooklyn

BY M. BERNARD

Assistant Engineer Way and Structure Department, Brooklyn (N. Y.) Rapid Transit System

IN THE issue of the ELECTRIC RAILWAY JOURNAL of March 16, 1918, W. L. Whitlock, office engineer Denver Tramway, describes a type of special work which is designated as the "outside" switch. This refers to the location of the tongue and switch on the outer rail instead of its normal position on the inner rail.

Since the function of special work and any other track structure is to guide rolling stock to its destination in the most economical manner, it follows that the use of proper types is of great importance. A description of the types in use on the Brooklyn Rapid Transit System and the various stages of development leading up to their adoption may be of interest.

Originally all special work of girder construction was of the standard hard-center type as illustrated in Figs. 1A and 1B. The tongue switch was located on the inside in all layouts, the mate on the outside, and all frogs were constructed with flangeways in both runs. About 1902, as a result of a variation of traffic conditions, these types were modified as illustrated in Figs. 2A and 2B for use at locations where the traffic over one run was negligible as compared to that of another. At such points the tongue switch was placed on the outside rail, the mate on the inside rail, and the frogs were made of the "jump" type, that is, the flangeway for the light traffic rails was omitted, necessitating the wheels jumping over the unbroken main line. The hard center feature was, however, retained. The reasons in favor of this type are well set forth in Mr. Whitlock's article and are therefore omitted here. About the same time, also, to facilitate ease of riding, the practice was introduced of installing a tongue mate with a tongue switch in the trailing ends of all standard type layouts. This is illustrated in Fig. 3.

About 1909 the use of the outside tongue switch type was discontinued and the use of the tongue switch on the inside was adopted for various reasons, partly enumerated below. About the same time the use of bolted construction instead of hard-center construction in the jump type was inaugurated. This is illustrated in Fig. 4. Some of the objections to the use of the tongue switch on the outside and a plain mate on the inside are as follows:

With the mate on the inside there is quite a portion of the inner curve unguarded, the length depending on the radius, wheel flange, etc. This condition is liable to produce derailments of cars and is aggravated by the requirement of flange-bearing in most mate designs, so that in time the plane of the wheel treads of cars going around the curve is higher on the inner rail than on the outer. The flanges of the wheels of cars going over the main line, also, cut into the floor of the mate forming a ridge. Unless this is ground regularly it may become large enough to cause trouble just at the time when least expected or, rather, least desired. This condition also develops in a lesser degree with tongue, switches and mates in their normal position, but it is minimized by the guard action of the tongue. The design of a tongue mate requiring a "break" in the straight gage line where there is more or less pounding also affects the corresponding part of the mate opposite and consequently there is not as much difference in the cost of maintenance of the two types as might at first be inferred. The use of two different types requires a more elaborate system of records and a larger number of stock pieces to take care of the necessary renewals.

The practice of installing a pair of tongue switches in the trailing position in regular layouts was discontinued in 1911 and the original type was readopted as

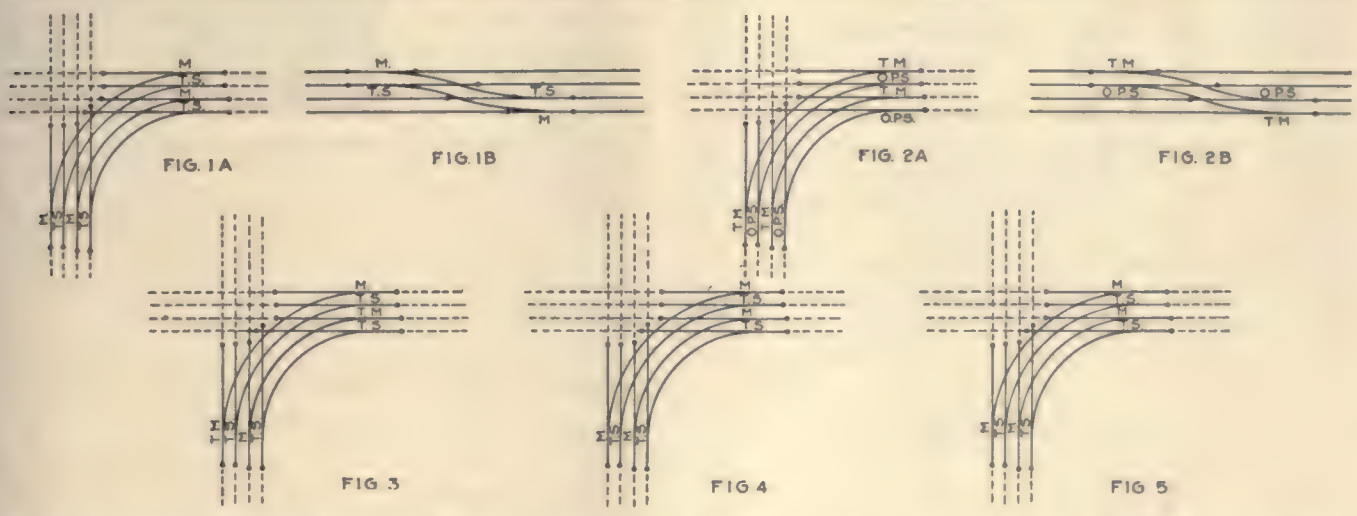


Fig. 1A—Double connecting curves with "hard center" frogs and flangeway in both runs. Tongue switch on inside.
Fig. 1B—Cross-over with "hard center" frogs and flangeway in both runs. Tongue switch on inside
Fig. 2A—Double connecting curves with "hard center jump type" frogs and flangeway for main line only. Tongue switch on outside
Fig. 2B—Cross-over with "hard center jump type" frogs and flangeway for main line only. Tongue switch on outside
Fig. 3—Double connecting curves with "hard center" frogs, flangeway in both runs and tongue mate with tongue switch in trailing ends.
Fig. 4—Doub'e connecting curves with "built up jump type" frogs, flangeway in main line only and inside tongue switch
Fig. 5—Double connecting curves with "hard center" frogs and flangeway in both runs in inner rail while outer rail has "built up jump type" frogs and flangeway in main line only. Inside tongue switch.

SPECIAL WORK DEVELOPMENT STAGES ON THE BROOKLYN RAPID TRANSIT SYSTEM

the results obtained did not seem to justify the additional expense, which amounted to about 40 per cent. The maintenance cost of a tongue mate also exceeded that of a plain mate in the same position.

The bolted construction in frogs of the "jump" type was adopted because of the cupping that developed in the rail abutting the hard center. This has been prevented by the use of an unbroken length of rail in the main line.

Subsequent to the adoption of this design in emergency layouts reports were frequently received that cars would not take the curve because the frogs in the inner rail in many layouts happened to come very nearly opposite those in the outer rail so that both wheels had to jump gaps at the same time, resulting in derailments. This led to the adoption of the present type for such layouts as is illustrated in Fig. 5. It will be noted that this type differs from that shown in Fig. 1A only in the design of the frogs in the outer rail, which are of the jump type.

The types illustrated in Figs. 1A and 1B are at present used on our system for regular operation and those in Figs. 3 and 4 for emergency operation.

Home-Made High-Potential Test Set

A SIMPLE but effective high-potential testing set used by a New Hampshire electric railway in the armature winding room is shown diagrammatically herewith. The apparatus consists of a 10-watt General Electric potential transformer whose high-tension winding is terminated in plug-handle contacts and whose

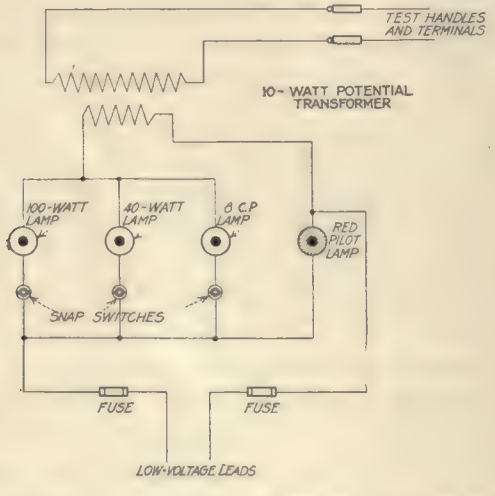


DIAGRAM FOR HIGH POTENTIAL TEST SET

low-tension side is connected through any one of three incandescent lamps to an ordinary 110-volt a.c. lamp socket.

Depending upon whether the 100-watt, the 40-watt or the 8-cp. lamp is thrown into the low-tension circuit, the potential at the high-voltage plugs is 1760, 1200 or 800 volts. When the terminals of the high-voltage side are short-circuited, as when a ground is found between a commutator bar and the motor shaft or core, the lamp burns at full candle power. The red pilot lamp shown at the right in the diagram burns continuously when the transforming low-voltage coil leads are plugged into circuit.

Efficiency and Safety of Electric Industrial Locomotives

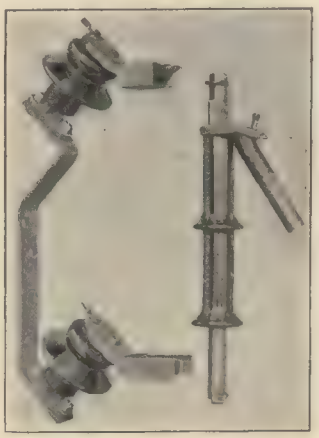
AN ELECTRIC locomotive used by a Massachusetts industrial plant was recently greatly improved by cutting down the cab housing as shown in the accompanying photograph. As originally designed, the housing extended across the full width of the cab, with the result that the operator could not see the track and coupler at the front of the locomotive, and at times there was delay in controlling the movement of the equipment. The cab housing was accordingly cut down for about 50 per cent of the width, and additional window space was provided in the center of the cab. The operator now has a clear view of everything in front of the machine as well as a better lighted working space in the cab itself. Increased production has resulted, owing to the faster and safer handling of the equipment made possible by the change.



ELECTRIC LOCOMOTIVE WITH REDUCED CAB HOUSING

Combined Disconnecting Switch and Fuse for Outdoor Use

THE combined fuse and disconnecting switch shown in the accompanying illustrations is used for the protection of transformer banks where no primary switches are used. The construction consists of two supporting petticoat type insulators on which are mounted the holders. The ends of the fuse are provided with brass contacts which can be pressed into the stationary clips on the supporting insulator. This type was designed by the General Electric Company primarily for operation in small outdoor substations. The contacts are protected against the effects of ice, sleet and snow by the method of mounting and by means of a punched hood attached to the top of each supporting insulator. This combined fuse and disconnecting switch is made in single-pole units for vertical mounting on flat surfaces. It is available for use at 15,000, 22,000, 35,000 and 45,000 volts. The maximum current rating is 50 amp. and no special arrangements are needed for mounting.



15,000-VOLT COMBINED FUSE AND DISCONNECTING SWITCH

American Association News

Company Sections Producing Unusually Instructive and Stimulating Programs.

Inspirational and Patriotic Talks Are a Feature at Practically Every Meeting.

N. W. Bolen at the Jersey City Meeting of Public Service "Hit the Nail on the Head" When he Spoke on "Our Job."

Filipinos Are Also Doing Fine Work in Preparing Papers for the Manila Section

Rousing Public Service Meeting at Paterson

THREE hundred members attended the April meeting of the Public Service Railway company section, which was held at the Market Street carhouse in Paterson on April 25. The plan of holding the meetings in different division centers is proving to be a great success, as was attested by the Jersey City meeting last month.

The Paterson meeting was a combined smoker and entertainment, J. L. O'Toole, assistant to the president, being the principal speaker. L. J. Tynan, attorney, and H. D. Briggs, assistant general claim agent, also spoke briefly. After the speaking the meeting was turned over to H. E. Feakes, supervisor Paterson carhouse, in charge of entertainment. There was a piano solo by a motorman and a sleight-of-hand performance by a conductor, while the "Boys' Band," consisting of sons of Passaic division trainmen, rendered several selections during the evening.

Mr. O'Toole's line of thought was that electric railway workers can and must stand behind the men at the front. Electric railway transportation furnishes an indispensible cog in the machinery of war preparation. He said not only is it necessary that this fact be realized, but electric railway workers should be leaders in showing patriotism by subscribing to the present and future Liberty Loans. He paid tribute to the results already achieved by the boys at the front and predicted, on the basis of past performance, that "they will continue to prove to the world that America can and will make good her vows."

N. W. Bolen on "Our Job"

AT THE March meeting of the Public Service company section N. W. Bolen, general superintendent, spoke on the subject "Our Job." As the title indicates, the talk was intended to impress upon Public Service men the importance of contributing their bit by faithful transportation work. After outlining some of the things which he had seen in his thirty-six years of railway service, and the difficulty involved in street railway work now, he raised the question "Why should any man remain in such a business?" His answer was that there is no industry so appealing to those who are really fitted to the arduous demands of this business. No other is so close to humanity, with its faults and virtues; no other is so closely linked with the industrial growth and prosperity of the community, and no other is more vital to the welfare of the country in the mighty struggle now going on.

To make his line of thought perfectly definite Mr. Bolen gave a list of the most important extra burdens which have been imposed upon Public Service by the war. At the extreme northern end of the line is Camp Merritt where as many as 30,000 soldiers are congregated at one time. At Edgewater is the plant of the American Can Company, which will ultimately employ 3000 men; while near by are the plants of the Aluminum Company of America, the General Chemical Company and the Remington Arms Company. At Bayonne is the Electric Launch Company and across the ferry is the Staten Island Shipbuilding Company, each with employees running into the thousands. On the Hackensack side is the Federal Shipbuilding Company, which will ultimately employ 7000 men; the Foundation Company with 3500 men, the United States Engineers' Depot with 600 men, and the Butterworth-Judson Company, acid manufacturers, with 3600 men. Further down are the plant of the Submarine Boat Corporation which later expects to employ 15,000 men, and also the Quartermasters' Depot employing 3000 men.

On Bloomfield Avenue, Newark, is the International Fuse Company. When an addition is completed for the manufacture of shells the total number of employees will approach 10,000. The Ford destroyer plant shortly to be started will, it is reported, require 12,000 men. Further south are the Weston Electrical Instrument Company and the Dusenberg Motor Company, each with 1000 employees, and the new plant of the Standard Aëroplane Corporation which will have 5000 men when running full. The Moore shipbuilding plant in Elizabeth employs about 1800 men, and at Bonhamtown the government is building a great ordnance depot facing on the Raritan River which will employ 6000 men. On the South Amboy line of the Public Service the Union Powder Company is rapidly approaching a total of 3500 employees and the Parlin Plant of the DuPont Company will employ 6500 men in the manufacture of powder. The Wright-Martin aircraft plant at New Brunswick is employing around 3500 men. At New Brunswick also the Johnson & Johnson Company employs more than 1000 people in the manufacture of bandages and surgical supplies.

In the southern division there is the New York Shipbuilding Company with 11,500 employees and the New Jersey & Pennsylvania Shipbuilding Company with 7000 employees. At Gloucester also the War Department will employ about 5000 men when running full. In round numbers, some 90,000 employees in the plants mentioned will be engaged in the manufacture of war materials, and Public Service is being called upon to transport a large proportion of them. Mr. Bolen said "Our job is cut out for us, and it is a big one; but I have faith in the ability of Public Service men to carry to successful conclusion any task to which they set themselves and faith that they will not fail in this national crisis."

"Patriotic Talks" at New Haven

THE regular meeting of the Connecticut Company Section was held on April 30, at the Hotel Garde, New Haven, preceded by the usual dinner. V. S. Curtis, secretary and general traffic agent, spoke on the "Express Department," and George E. Wood, mechanical engineer, read a paper on "Power Station Accomplishments." A number of "Patriotic Talks" on subjects of current interest were given by unannounced speakers.

Complicated Piece of Track Special Work

AT THE MEETING of the Capital Traction Company Section held at Washington, D. C., on April 11, the principal speaker was H. P. Huntting, engineer of way. He gave a talk on the installation, last year, of a complicated piece of special track layout at the junction of New York and Pennsylvania Avenues, and Fifteenth Street. This work was done without interrupting traffic, notwithstanding the fact that the intersection is located at one of the busiest points in Washington. An abstract of Mr. Huntting's paper will be given in a later issue of the JOURNAL.

At this meeting also a representative of the local Liberty Loan committee made a strong appeal for the purchase of Third Liberty Loan Bonds. As a result a campaign was instituted in the company's organization, similar to that carried on in the drive for the second loan. At the conclusion of the meeting refreshments were served.

Portland Section Hears Talk on Army Life

AT THE MEETING of the Cumberland County Power & Light Company section held on April 23 the principal speaker was Lieut.-Col. Frank B. Cummings, lately returned from France. He related his experiences from the time he left the United States until he reached the training camp in France. A lively discussion followed. The entertainment of the evening comprised a chalk talk by a member from the commercial department, a piano solo and a vaudeville act by local entertainers.

The Abuse of the Transfer

AT THE March 5 meeting of the Manila section, I. G. Obligacion, chief clerk transportation department M. E. R. & L. Co., read a paper on "The Menace of the Transfer." From this it appears that the transfer privilege is abused in Manila as elsewhere.

After outlining the advantages accruing to the railway and the public from the use of transfers Mr. Obligacion told of some of the local transfer abuses. The principal points made were these: A passenger asks for a transfer to a certain line and then presents it on a different line; when the conductor refuses to accept it the passenger complains to the management. A passenger on leaving a car meets some friends and forgets about the passage of time until several cars have gone by; he is then indignant because the conductor or the car boarded refuses to accept his transfer, and indulges in abuse of the system. Some passengers are indignant because the conductors will not assist them in getting a round trip for a single fare. Some passengers ask for transfers at certain transfer points and insist on riding to a more distant transfer point; when not permitted to do this they insult the conductor, give the transfers to their friends, use "late dates," "picked up," "plugged ones," etc.

In Mr. Obligacion's opinion the virtues of the transfers outweigh their defects but they should be checked and accounted for as accurately as fares. They are really parts of fares, and only through proper checking can abuses be prevented. The local company uses special rules for the administration of the transfer system, selects transfer points carefully, prohibits the acceptance of transfers outside of such points, punches the month and day on the transfer before it is sent out from the office, issues an individual punch to each conductor and changes the color of transfer pads on every line every fiscal year.

Filipinos Read Papers at Manila Meeting

AT THE MEETING of the Manila Section held on Feb. 12, T. Castillo, carhouse starter, outlined the duties of a man in his position. After stating that the first duty of a starter is perfect familiarity with the schedules, he listed the following as inspectors' duties: To keep extra lists properly in order to avoid inequitable distribution of work. To keep an accurate record of absences and their causes, and also a record of the capabilities of the men as to their familiarity with certain kinds of equipment. To study the trouble sheet so as to handle contingencies wisely. To have on hand enough cars and crews to take care of extra traffic, anticipating the needs of the public. To inspect platform men before allowing them to go on duty, to be sure that they are presentable in appearance and have all of the necessary equipment. To call to the attention of crews defects in track, line, streets, etc., which they should know about in order properly to perform their duties. To see that cars go out on time and in perfect condition. To perform their work in such a way as to keep the men contented. To report promptly to their superiors details of accidents and defects in any part of the system. To furnish the public with exact information regarding the operation of the system. To check and correct trainmen's reports so as to insure accurate data regarding car movements. To report daily to the superintendent of transportation as to all unusual occurrences, violation of rules, etc.

At the same meeting M. Fariñas, traffic inspector, spoke on "Trainmen as Witnesses." Mr. Fariñas pointed out that while the most valuable witness which the company can secure in the case of an accident is one who is not employed by the company in any capacity, an employee can be a valuable witness if he is careful to make statements that can be substantiated. An employee giving evidence for the company is placed at a disadvantage due to the fact that the judge is more likely to be impressed by declarations of witnesses for the plaintiff.

In addition to being prepared to substantiate his own statements, the trainman can be of great assistance in securing witnesses of an accident who will be able to give clear descriptions of it. The names of possible witnesses should be secured even though the passenger states at the time that his injury amounts to nothing.

CARNEGIE LIBRARY

LETTERS TO THE EDITORS

R. W. Blackwell and the Electric Railway Industry

LONDON, ENGLAND, April 15, 1918.

To the Editors:

By the sudden death of Robert W. Blackwell, after a very short illness at his residence, "Elmbank," Hampstead, on March 29, the electrical profession loses one of the few remaining and best-known pioneers of electric traction, and one whose name has been intimately connected with the most important branch of electrical engineering, both in the United States and in this country, for the last thirty-five years.

Born in 1858, Mr. Blackwell graduated as M. A. and B. LL. at Princeton University, where he was a contemporary of President Wilson. After graduation for a short time he engaged in the practice of law. Attracted however by the great demand for mechanically operated street cars, the need for which was so urgently felt in the United States, he jointly, with Edward W. Bentley and Walter H. Knight, founded in 1883 the Bentley Knight Electric Railway Company of New York, which installed and equipped an electrically operated tramway system in Cleveland, Ohio. This line opened for traffic in 1884 and was the first line to be operated electrically as a commercial undertaking.

Mr. Blackwell, as a contemporary of Sprague, Van Depoele and Edison, was intimately associated with the great pioneer work carried out in the United States between 1883 and 1889. Speaking at the sixth annual meeting in Philadelphia, of the American Street Railway Association, on Oct. 19, 1887, Mr. Blackwell said: "We entered the electric city tramway field long in advance of all others, and we believe that electric street railways for city service can be used effectively only where the power to drive the car is transmitted to it from a generating station." How true this pre-vision was has been amply demonstrated, although at the time many thought the future lay with the storage battery.

He was actively engaged in the management of his company until 1889, when he transferred the Bentley Knight Company's interests to the Thomson-Houston Company of Lynn, Mass. Mr. Blackwell was shortly afterward summoned to England to give evidence before Parliament on behalf of the first bill promoted by the Central London Railway Co. and it was the experience he gained during this stay which showed him the great prospects of electric traction in the United Kingdom and eventually, in 1890, induced him to take up his residence in this country. In 1890 he became associated with Messrs. Greenwood & Batley of Leeds, in conjunction with whom he opened an office in London for the purpose of introducing electric traction on the tramway systems of the United Kingdom. Speaking about the United States before the Institution of Electrical Engineers in 1892, Mr. Blackwell said: "The public has thoroughly supported those tramways which have introduced electricity, and has rewarded their enterprise by greatly increased patronage. That electric traction will receive the same acceptance here that it has already gained across the water, I do not doubt." Time more than justified Mr. Blackwell's anticipations, although several years of arduous pioneering work were necessary to overcome the opposition of inertia and vested interests before electric traction was definitely established in this country.

In 1894, Mr. Blackwell founded the firm of Robert W. Blackwell & Company which, in 1895 secured the contract from the British Thomson-Houston Company for the construction and electrical equipment of a new tramway in Bristol, and the work there carried out was so satisfactory that it at once secured for the firm the premier position as contractors in the electric traction field. The very great financial success secured by this first electrification on a commercial scale served as an incentive to many others to follow in its footsteps, and Bristol was visited and inspected by delegates from all parts of Great Britain and the Continent as a model electric tramway installation.

As engineers and contractors, R. W. Blackwell & Co. were henceforth connected with a very large majority of all the electric traction systems installed in the United Kingdom, amongst which may be mentioned: Bradford, Bolton, Cork, Central London Railway, Coventry, Cardiff, Chatham, Dublin, Doncaster, Giants' Causeway, Glasgow, Gateshead, Isle of Man, London United, London County Council, Leicester, Liverpool, Norwich, Nottingham, Plymouth, The Potteries, Reading, Southampton, St. Helens and many other British undertakings. Blackwell & Company supplied materials and engineering advice, also, to a large number of Continental firms. They were the expert advisers on traction matters to such firms as the Oerlikon Company, Shuckert & Company and Ganz & Company and their designs and specialties are to be found in a very large number of electric tramway installations throughout Europe, Africa, Asia and South America. It was they who designed the originally successful trolley standards for top seat tram cars and first standardized the pole and bracket arm construction for overhead lines. Wherever anything new was to be seen or experience was to be gained, there Mr. Blackwell went or sent his engineers or representatives to investigate and test, with the result that purchasers always came to him for information and advice. He showed in 1897, at the Brussels Exhibition, an

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(*Concluded from page 866*)

Mr. Fariñas also outlined the ideal accident report. The spirit of his talk is shown by this quotation: "Trainmen should make every effort to avoid discussions or arguments with passengers, should always be polite and courteous, and should seize every opportunity to make their passengers their friends. They must remember that at any moment they may be obliged to call upon these passengers to act as witnesses of an accident."

In discussing Mr. Fariñas' paper F. P. Santiago said among other things that "employees are good witnesses of any accident if they will just give a fair and unbiased description of what they saw. They should never make the mistake of exaggerating the facts of a case just because they want to favor the company. By misrepresenting the facts they may cause the company to refuse a just claim which may afterwards have to be contested in court. All that the company wants is the truth."

exhibit which was one of the most interesting in the whole British section. He was a member of the International jury there.

It is interesting to note that although American born and a very prominent member of the American Society in London, all Mr. Blackwell's associates and staff were British and the prescience shown by him in selecting men and the kindly assistance and advice and loyal support he always gave his staff has resulted in the launching of a great many engineers into the prominent positions they now hold in many parts of the world. His motto has always been—"You cannot afford to do bad work, the best only is good enough." His firm carried out many important works for English railway companies including the Great Western, the Great Central, and the London, Brighton & South Coast Railway Companies. The work carried out for this latter company included some of the most difficult bits of construction ever put up and erected under the most unfavorable conditions.

As the founder and chairman of Robert W. Blackwell & Co. Ltd., Mr. Blackwell's name has become a household word with all those interested in, or connected with, electric traction throughout the world. Not only as an engineer and contractor, but in many other directions Mr. Blackwell showed great initiative, as by building up a most successful manufacturing business in roofing and in other materials many of which previously had to be imported from abroad.

He was for many years also chairman of Messrs. Johnson & Phillips, electrical engineers and cable manufacturers, and did very much to bring them to the high pitch of prosperity they have reached to-day. He was as much loved and respected by his co-directors and the employees of this firm as he was by those of Messrs. Blackwell & Company.

Mr. Blackwell had many outside interests which cannot be referred to here. Sufficient be it to say that he was in charge of most of the arrangements for looking after the American Military Mission during their visit to this country, and that he was a great supporter of the American Red Cross and kindred societies.

He was a member of the Royal Automobile Club and of the City Liberal Club and always retained his membership in the Manhattan and University Clubs of New York. He was a prominent Mason, was Past Master of the Lodge of the Nine Muses and the founder of the American Columbia Lodge, and was awarded London rank for his Masonic services.

His memory will be kept green in the hearts of all these who had the privilege of his friendship, and nothing is more characteristic of him than the opinion expressed by one of his oldest friends, "Blackwell was as straight as a die."

PHILIP DAWSON.

Proposed Uniform Standard Track Spirals

WILLIAM WHARTON, JR., & COMPANY

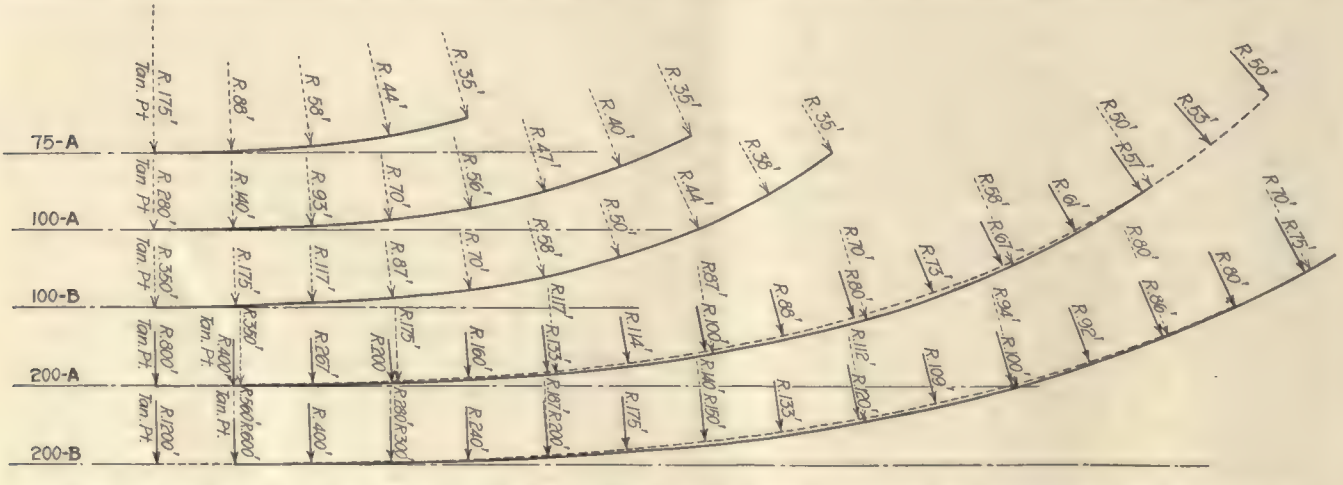
EASTON, PA., April 23, 1918.

To the Editors:

It is to be hoped that E. M. T. Ryder's article on track spirals, appearing in the issue of April 6, 1918, will arouse the interest of the electric railway engineers and the manufacturers of special track work in the subject, and that it will lead eventually to some uniform practice.

The manufacturers would welcome almost any system of track spirals that might be devised, providing it would satisfy the electric railway engineers and would find more general adoption by them. Without such general adoption in actual practice it would simply constitute another addition to the systems in use, increasing the troubles and vexations due to the lack of standard practice with which the special track work business is already burdened, and which show up in the cost of special work.

The trouble with most attempts at standardization is that the product produced is either no better, or is more costly than what has been in use, or both. A track spiral, to stand the chance of more general adoption must, first, be based upon a sound, recognized principle, which many of the present existing spirals in street railway practice are not. And, second, it must be simple and at least as easy of application as any of the existing systems. Most of the proposed standards aim at unnecessary refinement.



MR. ANGERER SUGGESTS USING FEWER AND LONGER CHORDS IN PROPOSED STANDARD TRACK SPIRALS

Mr. Ryder's proposed spiral, the writer believes, covers the first point; it may not cover the second point as fully as may be desired. Nearly all spiral systems now in use, with the probable exception of that of the Connecticut Company, employ too many changes of radius of curvature between the tangent and the circular or center curve. As far as alignment is concerned, if half the number of different radii, and in some cases even a less proportion, were used it would still give the same practical effect upon the running of the cars. In curving rails on a bending machine for spirals of the same length and same final off-set, one with twice the number of radii as another requires from 25 to 50 per cent more time to curve than the other.

It must be realized, of course, that, in order to make a design flexible and applicable to center curves of a range of radii, one must not go to the other extreme and have too few changes of curvature in the spiral. Conceding further that, in order to follow out a system or principle, the increments constituting or forming the spiral must be confined within certain limits, it would seem that Mr. Ryder had arrived at quite a satisfactory solution in the basic spiral, marked 100-*A* on the diagram. This spiral would be found most generally satisfactory and applicable. It may be that a somewhat longer spiral, as the one marked 100-*B*, would be preferred in some cases, particularly with center radii somewhat longer than 35 ft., in which case part of the spiral would be dropped off. Spiral 100-*C* could well be left out altogether, as it would rarely find application to curves with a short central radius. For spirals longer than 100-*B* and for use with longer central radii it does seem that longer chords and fewer radii could be applied to considerable advantage. Chords of 10 ft. in the 200 spirals would reduce the number of radii to fewer than one-half, to reach the same central radius. Spiral 200-*A* could thus be developed from spiral 100-*B* by using the same radii but with 10-ft. chords, making only six changes between 0 and 50-ft. radius. Spiral 200-B might be formed by doubling both chords and radii of spiral 100-*A*.

We would thus have four spirals, 100-*A*, 100-*B*, 200-*A* and 200-*B*, to which might be added the spirals shown on the top of the diagram of proposed uniform standards, which Mr. Ryder calls 200-*C*, but which probably had better be called 75-*A*. These five spirals would, in the writer's belief, cover all requirements. The two spirals at the bottom of Mr. Ryder's diagram, also called 200-*C*, are really combinations and any combination might be used, or might be necessary, to cover contingencies such as car clearances or avoiding of obstructions. It would seem that they should not be defined or included in a set of standard spirals.

The past attempts of the manufacturers and of the committee on way matters of the American Electric Railway Engineering Association have shown that the problem is not a simple one. Mr. Ryder has, undoubtedly, given the subject a great deal of thought and study, and the principle worked out and outlined in his article is extremely valuable. Any further development or modifications, and attempts at simplification might well follow the same lines. The comments and suggestions made herein are not a criticism, they are only made with the idea of helping along, in the hope of arriving at "something" that may finally prove satisfactory to all concerned and give us a real standard of spirals—one that will be used.

V. ANGERER, Vice-President.

THE AMERICAN RAILWAYS COMPANY

PHILADELPHIA, PA., April 27, 1918.

To the Editors:

Referring to Mr. Ryder's article on track spirals, printed in the issue of the ELECTRIC RAILWAY JOURNAL for April 6, 1918, page 649, and to Mr. Harvey's letter printed in the issue for April 20, page 775, it seems to me that there are many points in Mr. Harvey's letter which are worthy of careful consideration and which generally meet with my views. In this connection, I beg to quote from my letter of March 15, 1917, to Mr. Ryder as chairman of the committee on way matters as follows:

"As I understand the question it is not spirals which we are standardizing but a method of figuring spirals. In other words, all of the spirals at present in use are generally satisfactory from an operating point of view and this committee should develop if possible a simplified method of figuring the distance from the termination of the center radius to the point of the spiral curve, and this curve should be designed to permit the installation of a standard switch in the plain end without distorting the curve.

"If easy riding qualities can be obtained by a two or three-part compound curve, as suggested by Mr. Falconer of the New York State Railways, it would seem that we are getting into entirely too much figuring for the average draftsman on a small property if we divide our curve up into a greater number of parts.

In our practice we have used Wharton spirals exclusively. These appear to the writer to be well within the grasp of the average draftsman when used with the very complete data issued by the Wharton company. We have seldom found it necessary to use other than the plain-end No. 1 in connection with switch-end *A* and plain end No. 2½ with switch-end *B*.

In view of the fact that all of the larger operating companies have developed spiral standards of their own, sometimes with much elaboration, it might be pertinent to inquire how far the larger companies would follow a standard not of their own design. In the smaller companies I understand it is the practice to use whatever spiral is used by the special work manufacturer without question."

C. G. KEEN,
Engineer of Way and Structure.

War Affects Shop Planning System But Slightly

The planning system worked out for the Portland Railway, Light & Power Company, and described in the 1916 and 1917 Maintenence Issues of the ELECTRIC RAILWAY JOURNAL, has been found to be entirely successful and "works fine," Master Mechanic F. P. Maize reports. The system is in operation as described, except that under present war and labor conditions the advances cannot be made as originally contemplated. The only other change in the system is that girls have been substituted for men clerks in compiling the records.

Recent Happenings in Great Britain

Traffic Keeps Up Despite Fare Increases—Committee on Production Adjusts Tramway Wages—Miscellany

(From Our Regular Correspondent)

In the House of Commons Sir Albert Stanley, president of the Board of Trade, said that the addition of 50 per cent to railway fares at the opening of last year had not the desired effect in curtailing traveling. In all probability, a considerable number of passenger trains would be canceled at once. Should these restrictions prove ineffective, others will be put in force. "Curfew" regulations announced by Sir Albert provide that all places of amusement shall close at 10:30 o'clock at night. Other restrictions foreshadowed included a considerable reduction in tramway and electric railway services, including the underground services of London, and the rationing of London in coal next winter on a much lower scale than in the past. It is also proposed to extend rationing to the greater part of England. Munition works, hospitals and nursing homes are to be exempted. The reason for these restrictions is the remoteness of this particular part of the country from the coalfields and the difficulties of transport.

The Recent Wage Award

Threatened strikes of tramway workers in various cities of Great Britain have been averted by the award of the committee on production. It states that men aged eighteen years and over, and the grades of women aged eighteen years and over whose terms of employment include an understanding that they shall be paid the same rates as the grades of men whose places they have filled, shall receive such an advance as would give £1 a week over the pre-war rates of the grades concerned, payment to be made on the basis of a week of six days or shifts. Women aged eighteen years and over who are not covered by this decision are to receive an advance of 4s. a week, subject to a maximum of 20s. a week, over the pre-war rates of the grades concerned. Girls, boys, and youths under eighteen are to receive such an increase as will give them half the additional advances provided by the committee's award to the men or women, as the case may be, in the same undertaking. The advances went into operation on the pay day in the week beginning March 4, 1918. The award does not include women to whom apply the provisions of the orders made by the minister of munitions under the munitions of war (amendment) act of 1916. Officials of the Transport Workers' Federation state that the award is satisfactory.

Edinburgh Lease Expires in June

The lease between the Edinburgh Corporation and the Edinburgh & District Tramways expires in June of next year, and steps are being taken to consider the future policy of the corporation with regard to the undertaking. The sub-committee of the Corporation tramway committee has decided to recommend to the full committee that the time has arrived when a tramway manager should be appointed.

The town clerk at Edinburgh has been notified that the corporation proposes to apply in the present session of Parliament for powers to construct tramways between Edinburgh and Queensferry.

Sunday Service Agitation

The Southport tramways committee has decided to recommend to the Council that it run the trams on Sundays. Hitherto there has been no service of Sunday cars on the corporation system, but only on that of the Southport & Birkdale Company, recently acquired by the town for £35,000. The ratepayers have twice voted on the question of Sunday trams on the corporation lines, and have each time recorded a substantial majority against the plan.

The Liverpool tramways committee, having decided to create the office of deputy manager, has appointed to that position J. S. D. Moffet, general manager of the Belfast Corporation Tramways. From 1896 to 1898 Mr. Moffet was assistant borough engineer of Sunderland, from 1898 to 1904 assistant in charge of the tramways and improvements department under the engineer at Rochdale, from 1904 to 1913 general manager and engineer of the Rochdale Corporation Tramways, and from 1913 to 1916 general manager and engineer of the West Ham Corporation Tramways. He went from West Ham to Belfast.

London Traffic Increases

At the annual meeting of the Underground Electric Railways, London, Ltd., the chairman said that during the past year there had been a remarkable growth in the business done by the various companies included in the underground system, but that this growth had been accompanied by increases of expenditure, due to the increased war bonuses to the staff, both on the railways and on the omnibuses, that offset the gain in gross business. The increases of wages during 1917 would affect the 1918 accounts to a still further degree, even if there were no further advances. Increases in fares during 1917 accounted for a certain portion of the larger receipts. The Underground now controls most of the passenger service in London. It carried approximately 900,000,000 passengers a year. The majority of the fares of these passengers was 2d. or under. The satisfactory result of the through running of the London electric trains to Watford was encouraging as an indication of what the company hoped to achieve when the program of improvements up for consideration in 1914 could be carried through to completion. The chairman also said that London was grateful to the companies, for without the organization the people would have been stranded and immobile in the present crisis.

Though women drive trams in many provincial towns in Great Britain, they have so far been forbidden to do so in London. It now appears that the ban on women drivers is to be removed. According to a report of a conference of the tramways committee of the Board of Trade James Devonshire stated that it was probable that women would be licensed as tramcar drivers shortly in the metropolitan area, but that the police would take no responsibility with regard to trade union difficulties.

New Fares for Nottingham

The new scale of fares on the Nottingham Corporation tramcars has been put into effect, notwithstanding protests from various quarters. The raising of prices has been forced on the committee by the increase in wages. Briefly it may be said that all the odd halfpenny charges are raised to the level penny, that the journeys are reduced to something like what they were in the early days after the system was electrified, and that overlapping stages have been abolished. The transfer tickets were done away with some time ago, but this is the first general advance in prices that has been made.

Financial Readjustment Proposed

The committee appointed in July, 1917, by the holders of the debentures of the London United Tramways states in an interim report that it has made considerable progress with the representatives of the shareholders in agreeing on a scheme for the readjustment of the capital. The arrangements proposed are, however, dependent upon the passing into law of a bill now before Parliament, and until this is assured it is not possible to submit any definite proposals for the consideration of debenture holders. The bill in question provides, among other things, for an extension of the periods of the various franchises under which the tramways are operated, and also permits of some increase in the fares. The tramway system urgently requires a large expenditure on renewals and repairs.

Subject to the provision of the bill, the committee has agreed to recommend nearly £250,000, and other funds accumulated in the receivership should be applied to the habilitation of the physical system. It has also agreed to the conversion of part of the existing debenture stock into preference shares so that, if necessary, part of the earnings otherwise applicable to debenture interest may for a period be diverted to maintenance.

A. C. S.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Boston Relief Prospects

Terms of New Measure Still Being Considered, But No Wide Differences Have Developed

Prospects appear good for the passage at this session of the Massachusetts Legislature of an act to provide increased revenue for the Boston Elevated Railway. The exact terms of the measure to be presented soon for discussion on the floor of the House are still under consideration in the committee on ways and means, which recently concluded public hearings upon the bill (House 1442) reported by the committees on metropolitan affairs and street railways, sitting jointly.

Company Favors Public Control

M. C. Brush, president of the company, recently informed the ways and means committee that under present conditions public control along the general lines of the bill appeared likely to lead to favorable results. He said that the most important point to realize was that the public needed high-class transportation service, developed according to its growing requirements. In general, the company supported the idea of public control, with guaranteed dividends and fares rising or falling as required to meet the full cost of the service. The management felt that the company had been too liberal in accepting the burden of subways developed and carried during the last twenty years.

On May 1 Governor McCall sent a letter to the committee stating various objections held by him to the bill as it stood at that time. The Governor's principal objection was that the contractual relations between the company and the State should not be made permanent. He also urged that the State should not give away, as a contract right, any part of its power to regulate the company, should it revert to private management, and that the State should not abandon its power to take the property by right of eminent domain. The Governor also favored the control of the company by unpaid trustees, believing that a higher grade of ability can be secured for this service in such case.

How the Commission Feels

At the final hearings Chairman Macleod of the Massachusetts Public Service Commission offered several criticisms of the bill. He pointed out that the State had overreached itself in driving too hard a bargain with the company and said that it was out of the question to maintain a 5-cent fare and relieve the taxpayer from any contributions whatever to meet the cost of transportation facilities. The chairman objected to that part of the bill requiring the State to turn back the property in better condition than when it was received in the event of private control being restored at the end of the ten-year period.

Subway Purchase Favored

The Public Service Commission was still of the opinion that the purchase of the Cambridge subway by the State would be advantageous to both the company and the public. It also believed that there was no sound justification in the bill for requiring dividends of 6 per cent to be paid on the common stock at the end of four years, contending that if, as the result of present conditions, common stock could be issued at par on a 5½ per cent basis, it was better that temporary needs should be financed by the issue of preferred stock at a somewhat higher rate than that the car riders should be compelled to pay an excessive rate indefinitely on all the stock now outstanding.

Contempt Case Dismissed

At the conclusion of arguments recently in the Superior Court in Seattle, Wash., Judge John S. Jurey dismissed the contempt proceedings instituted against the Puget Sound Traction, Light & Power Company by Hugh M. Caldwell, corporation counsel of the city. The citation ordered the company to show cause why it should not be adjudged in contempt as a result of an advertisement published in a morning paper of April 15 bearing on the city's suit to collect $60,917, as the company's proportion of the construction cost of the Fremont Avenue bridge, and $666 monthly for maintenance.

Mr. Caldwell argued that the appearance of the advertisement on the morning the case was set for trial tended to prejudice the city's case with the court or jury. In dismissing the action, Judge Jurey ruled that although the advertisement referred to the case in question, it was self-serving on the face of it, and could not seriously be taken as tending to influence the court.

Attorney Howe, for the company, declared the advertisement was not intended to prejudice a jury.

The company obtained a continuance of the trial until May 6, pending a decision of the Supreme Court in an alleged similar case from Tacoma. Mr. Caldwell obtained a writ of mandate from the Supreme Court ordering Judge Jurey to show cause on April 26 why the case should not immediately go to trial.

Arbitration for Cleveland

Cleveland Men Accept Arbitration—Company Waives Demand for Open Shop and Women Employees

The Cleveland (Ohio) Railway and its employees on May 3 agreed to submit their wage controversy to the National Labor Board to be adjusted by arbitration. The wage scale, length of runs and conditions for Sunday, night and holiday operation are the ones that will be settled by arbitration. The company agreed to drop its demand for open shop and the employment of women, concessions on other points having been made by the men.

The old contract provided that all differences may be submitted to arbitration. The men argued that "may" in the contract could not be construed as "must" and on that ground they refused to arbitrate the company's demand for an open shop and the employment of women as conductors. J. J. Stanley, president of the company, made these demands in order to render better service. The men say that motormen and conductors who have left the service will return if the wages are made sufficiently attractive.

Mayor Harry L. Davis issued a statement asking that the company and its employees get together. He advanced patriotic reasons for avoiding a strike at this time.

Developments on May 2

William B. Fitzgerald, vice-president of the Amalgamated Association, conferred with President Stanley on May 2 and a number of conditions of the proposed contract were discussed. Neither the matter of wages nor the company's demands noted previously had been reached late in the afternoon.

Mr. Faulkner, representing the federal labor department, offered his services. They were accepted by the union. President Stanley, however, preferred that the matters in dispute should go to arbitration. It was understood that he then insisted on the open shop and the employment of women. As has been stated before, Mr. Stanley held that all matters in controversy were subject to arbitration under the old contract, while the men contended that Mr. Stanley's demands were not intended for arbitration under the terms of the wage agreement.

On April 29 the trainmen voted to strike unless their demand for increased wages and improved conditions, as heretofore outlined in the Electric Railway Journal, was granted. No time was set for this action. The contract under which the men have been working expired on May 1.

New Chicago Proposal Advanced

Counsel for the Aldermanic Committee Suggests Plan Which Embodies Trusteeship Idea for Surface and Elevated Lines

Chicago Aldermen, who have been considering a new franchise for the local traction companies, had a chance to consider "immediate municipal ownership" in a new form at a meeting of their sub-committee on April 29. This latest development in the ordinance negotiations was brought about by the submission of a "trustee plan of public ownership" by Walter L. Fisher, special counsel for the committee.

Trusteeship Plan Proposed

Mr. Fisher stated that his plan was based on the same general principles as the Boston trusteeship plan and the general railroad policy recently put forward by Theodore P. Shonts, president of the Interborough Rapid Transit Company. He contended, however, that both these plans, by having the taxpayer carry part of the burden of transportation, involve a principle "of more than doubtful expediency."

The new plan requires that all the surface and elevated properties be turned over on agreed terms to a new corporation, to be operated solely for the public benefit without profit and subject only to payment of the actual cost of financing. The new corporation would consist of a board of trustees to be composed of public-spirited Chicago men, having perhaps some official of the city and a representative of the employees as directors ex officio. There would be provision also for an executive committee to give full attention to the properties and to be paid appropriate salaries.

Mr. Fisher would have his new corporation take over the properties subject to the outstanding bonds and other securities to an amount not exceeding the agreed purchase price. Any money needed for extensions and improvements would be raised by the sale of bonds at low interest rates. Present security holders would receive some new form of security and a rate of return to be agreed upon.

The rate of fare would start with 5 cents and possibly a 1-cent charge for transfers between surface and rapid transit lines. There would be provision for increasing or decreasing the fares and transfer charges, so that service might be furnished at cost. Mr. Fisher also expressed the opinion that it would seem to be sound policy not to increase rates when this could be avoided by eliminating the cost of street paving and cleaning.

The Fisher plan is admittedly based on the essentials of the contract plan of municipal ownership advocated by Mayor Dunne in 1905, but its author says it avoids all the objections urged against municipal ownership.

The Aldermen did not take kindly to the idea. They could not see how the present security holders might be persuaded to turn over $220,000,000 worth of property to a board of disinterested citizens with no guaranty of a return other than that which might be found in the revenues from operation. They were afraid the proposed board of trustees might develop into a political coterie. The proposal will be discussed at further sessions.

What the Companies Propose

Speaking for the Chicago Surface Lines and the Chicago Elevated Railways, President Busby of the former company on April 25 outlined the terms upon which they will go into the plan for unification of all traction lines and the construction of subways. This statement was presented at a meeting of the sub-committee of the City Council which has been considering the essentials of a new ordinance.

The companies propose a thirty-year franchise, the city to have the right at any time to take over the properties on payment of the established purchase price, or to take them at the end of the franchise subject to the outstanding indebtedness. If the city does not exercise this option at the expiration of thirty years, it is proposed that the company shall have the right to continue operations under the ordinance.

Mr. Busby also suggested the establishment of a "traction fund" into which the company should pay annually a specified amount for amortizing discounts and expenses in connection with the issuance of bonds; also a sum equal to 5 per cent on the cost of city owned subways and equipment; also all "surplus receipts." These "surplus receipts" are to consist of the amount remaining after the following deductions: operating expenses, including payments for amortization and for the "traction fund"; actual interest on bonds within city purchase value; 5 per cent on the excess, if any, of purchase value over the par amount of such bonds; actual sinking fund payments; subway rentals; and an amount equal to 1.75 per cent of the average purchase value for the year, as a minimum allowance to the company in addition to the interest mentioned above, and a per centage to be determined from time to time by the local commission to make up a fair and just return to the company.

Five-Cent Fare With Two-Cent Transfer

The proposal is made that the rate of fare be 5 cents, with a charge of 2 cents for each transfer between a surface and a rapid transit line, and without charge for any other kind of transfers. As a safeguard against having the receipts go below the point where the above payments can be made, it is suggested that the city agree to join with the company in applying to the local commission for an increase in fares when this is necessary.

For the purpose of carrying out the plan at a minimum cost to the traveling public, it is suggested that the service be relieved of all non-transportation charges such as paving, maintaining paving, and the sprinkling and cleaning of streets. The city is also asked to provide for the carriage of express and light freight under conditions which will not interfere with passenger transportation.

Counsel for the committee announced that he did not agree with some of the proposals of the companies, his principal objection being against an interest return in excess of the actual cost of financing. Mr. Busby explained that the companies' proposal on this point was different in form but not in substance from that of the Traction & Subway Commission, which recommended a varying rate of return. The sub-committee will hold other sessions to discuss these differences.

Seattle Wage Offer Rejected

Trainmen Vote Down Raise of Five Cents an Hour, Accepted by Committee as Satisfactory.

The offer of the Puget Sound Traction, Light & Power Company, Seattle, Wash., to raise the pay of its trainmen, and to enter into a new agreement, has been voted down by the union of trainmen, by a vote of 756 against 148.

The proposed agreement provided for an increase of pay for trainmen of 5 cents an hour, and for $15 a month extra for other crafts paid monthly, the agreement to take effect on April 15, 1918, and to remain in force until Aug. 1, 1919, or until sixty days after the conclusion of peace with Germany, if the war ends before that time. The present agreement between the company and the men expires on July 31.

One of the main reasons for the men's refusal to accept the new agreement was that recognition was not given to their demand for an eight-hour day, with time and a half pay for overtime work.

A. W. Leonard, president of the company, stated that the new wage scale had been previously agreed upon by representatives of the employees, and the agreement had been posted in the carhouses and other company buildings in Seattle and in Tacoma. He said that both the company and the committee representing the employees felt that the increase offered was substantial and that it would have the effect of retaining the employees in the service. During the full period of the proposed agreement the men would have drawn $295,000 additional. The present wage scale is from 33 cents to 40 cents an hour. The proposed new scale ranged from 38 cents to 45 cents an hour. Under the new scale the average monthly wage of trainmen would have been increased from $103 to $118, and the new average for men drawing the highest hourly pay would have been increased from $115 to $130 per month. Since the declaration of the war 3319 men have been employed in the various departments of this company, and 3513 have left the service.

Montreal Commission Named

Body Provided for in New Tramway Franchise Will First Take Up Fare Question

Judge Saint-Cyr of the Court of Sessions, Prof. L. A. Herdt of McGill University, engineer, and John S. Archibald, architect, have been appointed by the Lieutenant-Governor-in-Council to be the three members of the permanent tramways commission provided for in the new franchise accorded to the Montreal Tramways and ratified at the last session of the Quebec Legislature.

The first duty of the new tramways commission, will be to fix the rate of fares. This must be done within sixty days from the date of appointment. Various clauses of the new franchise will be the real deciding factor in determining the fares, but expectation has been general that there will be an increase on the present tariffs. For example, there is a fund provided for lowering the fares. When the amount of this fund goes down, the fares will go up, and vice versa. It will be the tramways commission which will decide.

The three members of the commission are appointed for ten-year terms, but can be removed by the Lieutenant-Governor-in-Council for cause, and either the company or city of Montreal, by means of quo warranto proceedings, can demand the removal of any commissioner for fraud, corruption and refusal to fulfill in good faith his duty. The commission or its employees are authorized to look over the books of the tramways company, but to examine, verify or audit the affairs of the company must employ a chartered accountant. Each year the commission must make a report to the city on the state of the railway system.

A brief review of the provisions of the contract for the thirty-five year franchise under which the commission was appointed was published in the ELECTRIC RAILWAY JOURNAL for Feb. 9, page 288.

Arbitration for Salt Lake City

After arbitration had been decided upon as a means of settling the differences between the employees and the Utah Light & Traction Company, Salt Lake City, Utah, questions arose as to what to arbitrate and what not to arbitrate. Officials of the company contended that it was their understanding that the entire question of wages and one-man operation was to be submitted. The employees announced that they would not arbitrate the one-man operation question. Then officials of the company announced that they would eliminate the one-man car question from the matters to go before the arbitration board. A statement made public by H. F. Dicke, general manager of the company, was concluded as follows:

"If the men do not want to arbitrate one-man operation the company will not insist upon it. We will proceed with the arbitration of wages and such other minor matters as have been discussed, and if the settlement involves any increase in wages the company may find it necessary to ask the Public Utilities Commission for permission to inaugurate this method."

Council May Take Up Wages

At a conference with representatives of the trainmen of the Toledo Railways & Light Company and Federal Mediator A. L. Faulkner on April 24, Mayor Cornell Schreiber of Toledo, Ohio, agreed that the question of an increase in the rate of fare to meet an advance in wages of motormen and conductors may be submitted to the Council for consideration. This plan was approved by officers of the company.

The Mayor still expressed his objection to any increase. He said the average wage received by men who had been with the company a year or more was higher than he had expected. City accountants figured this from the books of the company to be $90.30 per month. The Mayor expressed the belief that the men were not entitled to an increase of 10 cents an hour at this time.

John Quinlivan, business agent of the Central Labor Union, declared that the wage estimate of $90.30 took in overtime and that the men should not be expected to work from thirteen to eighteen hours in order to make a fair average wage.

Confer on Franchise Relief

Officials of the Rhode Island Company on April 30 met with members of the city government of Providence, R. I., to discuss measures for financial relief, which were recommended in the report of the special investigation commission but which were not made compulsory by the General Assembly.

The report recommended that the company be relieved from the payment of the present heavy franchise tax in Providence. It also recommended that the company be not required to pay for the paving between its rails unless the use of the streets by the company was the actual cause of the damage. Another recommendation was that the city relinquish control over the company in favor of the Public Utilities Commission. These matters all came before the General Assembly, but it was so late in the session before the decision was reached to adopt the zone system that these subjects were left to die in committee.

It is understood that city officials do not favor Providence making concessions if the other municipalities through which the company operates collect their franchise taxes and exact paving obligations. It is also said that the representatives of the city are not in favor of the complete elimination of the franchise tax, although they are inclined to consider favorably a substantial reduction in the tax. There is positive opposition among city officials to granting the request that the city relinquish control over the company within the city limits. It is expected that it will take several weeks before a conclusion is reached.

For Army Technicians

Government Providing Courses—7500 National Army Men Now in Schools —90,000 to Be Trained This Year

Under plans drafted by the committee on education and special training, appointed by Secretary Baker last February, twenty-five schools are now under contract to give the intensive training needed for various technical and skilled work by the army, such as motor truck drivers, airplane mechanics, carpenters and blacksmiths. There are now 7500 National Army men under such instruction, and the number of schools will be increased until 30,000 men can be handled at one time. The courses are of eight weeks' duration so that it is expected that 90,000 men will be trained this year. The final lot of 30,000 men will go to the schools on Sept. 1.

While the men at the schools are National Army men and come through the draft boards they volunteer for this special training and go to the schools directly from their homes. They are not drawn from the cantonments. To insure proper assignment, a plan is now being worked out whereby all men will be sent first to a number of reservoir schools and then sent to study the work for which they are best qualified.

News Notes

Increase in Wages in Everett.—The Puget Sound International Railway & Power Company, Everett, Wash., has announced an increase of 3 cents an hour, or 25 cents a day, in the wages of its trainmen.

Wage Increase of Two Cents an Hour.—The New Jersey & Pennsylvania Traction Corporation, Trenton, N. J., has granted an increase of 2 cents an hour to the motormen and conductors on all the divisions.

Military Service Folder.—A folder has been printed giving the names and assignments, as of Jan. 1, 1918, of the executives and employees of the H. M. Byllesby & Company organization in military and naval service.

Strike on Kansas Line.—Conductors and motormen of the Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan., went on strike at 4.30 o'clock on April 21. The men demand recognition of their union, but are said to be satisfied with wage conditions.

Motorman Buys a $5,000 Bond.—Charles Owings, a motorman in the employ of the United Railways & Electric Company, Baltimore, Md., has bought a $5,000 Liberty Bond. Owings has been connected with the railways in Baltimore for more than twenty-five years.

Tightening of Control Urged.—A charter amendment providing stricter control of public utilities in Portland, Ore., has been submitted to the City Council by a committee from eight civic clubs which asks that the amendment be put on the ballot at the coming primary election. C. L. Rauch is chairman of the committee, which has investigated the 6-cent fare decision.

Increase in Wages in Los Angeles.—The wages of the trainmen on the entire Pacific Electric Railway system, Los Angeles, Cal., were increased on April 16. Those who work on the interurban lines received an advance of 3 cents an hour and those on the local lines 2 cents. Trainmen on the freight and work trains received a proportionate increase. The advance was made voluntarily by the company.

Trained Men for Washington.—Practically all of the departments in Washington need technically trained men. One of those from whom this paper has received an application this week is the Bureau of Mines Experiment Station, which has special need of bacteriologists, chemical engineers, electrical engineers, machinists, and steam fitters. Blanks will be sent to anyone who wishes to file an application.

Trenton Indictments Quashed.—The Supreme Court of New Jersey has quashed the indictments found against officers and directors of the Trenton & Mercer County Traction Corporation. The city sought to indict the officials for erecting poles and stringing wires on certain streets without proper authority from the municipality. It was a phase of the fight of the city against the company, based upon alleged inadequate service.

Women May Be Used in Camden.—The Public Service Railway, Newark, N. J., is seeking applications from women for possible employment on the cars of its Camden lines. Male employees on the division have been asked to recommend women whose husbands or brothers have joined the colors. These will be given preference in filling the places. Up to May no women had been used in the train service even experimentally.

Mayor Signs Subway Relief Bill.—The Lockwood bill, authorizing the Public Service Commission and the Board of Estimate of New York City to relieve the contractors building the new subways from the burdens placed upon them by the high costs of labor and materials, and to do whatever is best to complete the work as speedily as possible, was approved on April 30 by Mayor Hylan. It is expected the Governor will sign the bill.

Philadelphia Hearing Continued.—The hearing being held in regard to the final ratification of the lease agreement for the operation of the city high-speed lines by the Philadelphia (Pa.) Rapid Transit Company, was resumed before the Public Service Commission on April 25. Director of City Transit Twining said that the city in the 1907 contract with the company confirmed all the rights and franchises of the company and that the 1907 contract must be recognized in the present negotiations.

Wage Advance in Philadelphia.—The co-operative committee of employees of the Philadelphia (Pa.) Rapid Transit Company at a meeting held on April 27 determined in company with the management to advance the rate of pay of all motormen and conductors 2 cents an hour so that effective from May 1 the new scale will be as follows: New men, 33 cents; after one year's service, 34 cents; after two years' service, 35 cents; after three years' service, 36 cents; after four years' service, 37 cents; after five years' service, 38 cents.

Arbitrators Recommend Increase of Wages.—The board of arbitration which heard the claims of the employees of the Hamilton (Ont.) Street Railway for an increase in wages has forwarded its report to the Minister of Labor. The men asked for an increase from 24, 26 and 30 cents an hour for first, second and third-year men respectively to 36, 38 and 42 cents an hour—or an increase of 12 cents all around above the present wage scale. The arbitrators have recommended a basis of 30, 34 and 37 cents. The finding of the board was unanimous. The company has also allowed by agreement concessions in the way of overtime pay.

Gross Earnings Tax Argued.—Arguments on the demurrer entered by the Puget Sound Traction, Light and Power Company, Seattle, Wash., in the city's suit to collect $72,443, or 2 per cent of the gross earnings of the company for 1917, were recently heard before Judge King Dykeman in the Superior Court, and the case taken under advisement. Judge Dykeman announced that he would decide the present issue along with the city's application for a writ of mandate compelling the company to do its proportion of paving on West McGraw Street from Queen Anne Avenue to Queen Anne Boulevard, which the court has had under advisement for six months.

Praise for British Columbia Electric Railway.—The *Daily Province* of Vancouver, B. C., for March 26 contained a full-page illustrated historical review of the British Columbia Electric Railway properties. In appreciation of the work of the company the paper said: "The history of any great undertaking such as the British Columbia Electric Railway is always tinged with romance. It required great faith in British Columbia for these 10,000 shareholders and directors to send their $50,000,000 6000 miles away into public utility properties. In a sense this was real empire building, for British Columbia electric development has made Vancouver and Victoria."

Only One Way Out.—Following a conference of electric railway employees of Rochester, Syracuse and Utica in his office recently to discuss a demand for an increase of 9 cents an hour in wages, James F. Hamilton, vice-president of the New York State Railways, gave out a statement in which he said the men had put forth the demand for the increase on the ground that the cost of living made higher wages imperative, and that the company recognized the justice of the men's demands, but that it could not grant any increase until the revenues of the company were increased. Mr. Hamilton promised that efforts would be made to convince city administrations that the only source of relief for the company and the men was in increased fares.

Joint-User Rights Determined.—Justice Cropsey in the Supreme Court in Brooklyn, N. Y., has decided that the Brooklyn & North River Railroad cannot string its own power-carrying wires on the poles and fixtures of the Manhattan Bridge Three-Cent Line on the Flatbush Avenue extension. Some time after the Three-Cent line began to operate on the Manhattan Bridge the Brooklyn & North River Company obtained franchises to operate on the Manhattan Bridge. The new occupant of the bridge had to buy its power from the Three-Cent line. The rate was considered too high and as a result an arbitration board fixed a rate which was still somewhat higher than other rates. The Brooklyn & North River Company protested to the court against this rate, but Justice Cropsey held that even though it cost the North River company more to buy power from the Three-Cent line than from other concerns, it was not entitled to string its own wires or power-carrying equipment over the Flatbush Avenue extension in Brooklyn.

Programs of Meetings

New York Electric Railway Association

The annual meeting of the New York Electric Railway Association will be held at Lake Champlain on June 22. The day will be devoted to a business meeting. In the evening there will be an informal dinner, at which two or three prominent men will speak. A detailed program of the meeting will be published later.

Iowa Electric Railway Association

The annual convention of the Iowa Electric Railway Association will be held in Des Moines, Ia., on May 23. Because of the additional burdens which have been placed on the members of the association, due to the war, the directors have decided that it will be best not to carry out the usual program this spring. Among the subjects which will be discussed at the meeting are questions of financing and legislative matters. A convention of the Iowa section of the National Electric Light Association will be held in Des Moines on May 22 and 23. This will permit members of the railway association who are interested in lighting to attend both conventions.

Financial and Corporate

War Finance Boards Named

President Selects Men to Supervise Financing—Names New Capital Issues Committee

The first step in the organization of the $500,000,000 War Finance Corporation has been taken. On April 30 President Wilson sent to the Senate the names of the four directors who, with Secretary McAdoo as ex-officio chairman, will conduct the work of aiding the financing of essential enterprises. The nominees for two-year terms are William P. G. Harding, of Alabama, and Allen B. Forbes, of New York; and for four-year terms, Eugene Meyer, Jr., of New York, and Angus W. McLean, of North Carolina.

Mr. Forbes, who is senior member of the utility investment banking house of Harris, Forbes & Company, New York and Chicago, has declined the nomination, owing to his interest in past flotations by a large number of utilities which may make application for future loans. No successor has been appointed.

Mr. Harding is at the present time a governor of the Federal Reserve Board. Mr. Meyer, a New York banker, is a member of the national war savings committee and is connected with the War Industries Board. His business activities cover a wide range in connection with the marketing of railroad, mining and industrial securities. Mr. McLean has had a successful career as lawyer, banker, manufacturer and farmer.

The new capital issues committee, as nominated by the President, will consist of the following seven members: Charles S. Hamlin, of Massachusetts; John Skelton Williams, of Virginia; Frederic A. Delano, of Illinois; James B. Brown, of Kentucky; John S. Drum, of California; Henry C. Flower, of Missouri, and Frederick H. Goff, of Ohio. This committee, created under the war finance corporation act, will replace the present voluntary capital issues committee of the Federal Reserve Board.

Mr. Williams is Comptroller of the Currency, a member of the Federal Reserve Board and a member of its present capital issues committee. Mr. Hamlin and Mr. Delano are also members of the Federal Reserve Board and the above-mentioned committee. Paul M. Warburg, now a member of this committee, was not appointed to the successor body, in order that he as vice-governor might be free to manage the affairs of the Federal Reserve Board during Governor Harding's work as a director of the finance corporation.

Mr. Brown is a prominent banker and business man of Louisville; he is a director of the Louisville Gas & Electric Company and has helped to organize many industrial and utility companies. Mr. Drum is a prominent banker of San Francisco and a director of the San Francisco-Oakland Terminal Railways, the Pacific Gas & Electric Company and other utilities. Mr. Goff, a Cleveland banker, has had extensive experience in banking and manufacturing. Mr. Flower is a leading banker of Kansas City. He was for many years a director of the Metropolitan Street Railway and the Kansas City Railway & Light Company. Both Mr. Goff and Mr. Flower have been members of the advisory committee of the present capital issues committee.

The existing committee, since its organization three and one-half months ago, has developed an extensive system of examining the merits of proposed security issues, through the cooperation of sub-committees in each Federal Reserve District, composed of bankers and business men acting as volunteers. This machinery probably will be used by the new organization. The committee in the last three and one-half months has approved new issues aggregating $103,000,000. It has refunded obligations amounting to $238,000,000, and it has disapproved $44,000,000 of proposed issues.

Decrease on Boston & Maine Properties

The annual report of the Boston & Maine Railroad for the year ended Dec. 31, 1917, covers the operations of the two owned electric railway branches, the Portsmouth (N. H.) Electric Railway and the Concord & Manchester Electric Branch, Manchester, N. H., and the one leased line, the Conway (Mass.) Electric Street Railway.

The combined operating revenues of the first two lines for the last calendar year were $264,843, an increase of $6,462 over the returns of the preceding year. This gain was more than offset, however, by the increase of $40,002 in operating expenses, which totaled $217,313. The main rise in operating expenses occurred in connection with repair of motor equipment of cars, maintenance of way, motormen and conductors, production of train power and legal expenses. The net revenue for 1917 was $47,030, a heavy reduction from $80,570 for the year before. The number of passengers carried increased from 5,073,785 to 5,210,793, and the number of revenue car-miles run decreased from 1,058,086 to 1,043,149.

The Conway Electric Street Railway made a poorer showing in 1917 than in the year before. The operating revenue decreased from $10,882 to $9,258, and the expenses increased from $8,886 to $8,924. Tax accruals more than doubled, and the deficit for the year amounted to $7,253 as compared to $5,186 in 1916.

Spokane Merger Progresses

New Company Will Probably Be Formed to Take Over Railway Property of Two Washington Lines

Progress in the plan for the merger of the railway lines of the Washington Water Power Company and the Spokane Traction Company was reported on April 26 by Attorney Frank T. Post, general counsel for the Water Power Company, at the joint meeting of the Washington and the Idaho Public Service Commissions. The merger has been under consideration for two years. Mr. Post said it was nearer a successful conclusion now than at any previous time, and informed Mayor C. M. Fassett that he could secure confidential information on the progress of the negotiations if he so desired. Mr. Post said:

"The plan is to form a new company to take over both properties. We will need the help of the city in this matter, as many changes are to be made. For this reason I would suggest that the Public Service Commissions of Washington and Idaho value the power and railway systems of the Washington Water Power Company separately, leaving the railway system until later. The changes in the street railway will materially effect its valuation."

Chairman Blaine of the Public Service Commission of Washington was not sure as to what could be done toward delaying the railway valuations. He said that a great many communities were interested in the light and power valuations and that it would be necessary to complete this at as early a date as possible.

The discussion as to the railway property of the Washington Water Power Company arose over the request of J. M. Geraghty, corporation counsel, for leave to introduce the franchises of the company in evidence. He said he was prepared to show that some of the company's chief franchises had expired and that others would expire in a year. He urged that the absence of a grant from the city seriously impaired the value of the property and that this situation should be borne in mind by the Public Service Commissions in fixing the value of the railway.

Title Taken to Chicago Line

The Chicago & West Towns Railway, Chicago, Ill., took title to the property of the Suburban Railroad, by Emil G. Schmidt, receiver, under date of Feb. 26, 1918, for $85,970 and $1. The company subsequently made a mortgage in favor of the Harris Trust & Savings Bank as trustee on its property in the western suburbs of Chicago to secure a bond issue of $1,000,000 as of March 1, 1918, and payable Sept. 1, 1920. Of the total amount $750,000 has been issued for the purpose of retiring indebtedness, while the remaining $250,000 is to be used for purchases and extensions.

Partial Abandonment

Interurban Would Discontinue in Four Towns and Abandon Part of Local Service in Another

A petition was filed with the Public Service Commission of the Second District of New York on April 19 by George Bullock, as receiver of the Buffalo & Lake Erie Traction Company, for leave to abandon that portion of the company's railroad from the junction of Main and Temple Streets, Fredonia, to the Pennsylvania State Line. Commissioner Barhite held a hearing on the petition in Buffalo on April 29.

The portion of the road proposed to be abandoned is about 28 miles long and runs through the towns of Pomfret, Portland, Westfield and Ripley. The road operates through Brockton, Westfield, Forsyth and several other villages.

The petition alleges that the earnings from the line proposed to be abandoned are not sufficient to meet operating expenses and that the earnings from that part of the road still proposed to be operated are not sufficient to yield a fair return and take care of the deficit in operating revenues on the non-paying portion. It is also alleged that demands have been made upon the petitioner to pay for paving streets and highways along the line proposed to be abandoned, the expense of which will equal, if not exceed, the total gross operating revenues of the line.

Commissioner Barhite on April 29 postponed hearing the petition for approval of the proposed abandonment of portions of the Dunkirk Street Railway, operated under lease by the Buffalo & Lake Erie Traction Company. The last hearing on the original petition for abandonment in Dunkirk was held on Nov. 26.

New Mortgage Proposed for B. R. T.

A special meeting of the stockholders of the Brooklyn (N. Y.) Rapid Transit Company will be held on May 23 to discuss the advisability of executing a new mortgage to replace the company's first refunding gold mortgage of July 1, 1902, which authorized an issue of bonds to the amount of $150,000,000.

The call for the meeting explains that the present mortgage served a useful purpose as long as interest rates were low, but because the maximum rate allowed on the bonds was fixed at 4 per cent, it had been impossible to sell any of them except at a considerable discount. No bonds have been sold since February, 1909.

The notice to the stockholders refers to the necessity of providing for the $57,735,000 of secured 5 per cent gold notes which mature on July 1. Whether it is desirable to have available additional bonds for collateral or whether the notes should be renewed is also to be discussed.

The directors hope to present a plan for taking care of the gold notes before maturity. These notes were issued for subway extensions, etc., under contracts with the city. Of the bonds authorized to be issued under the new mortgage, $87,040,000 will be reserved to take up the bonds heretofore issued. This new mortgage will be dated June 1, 1918, and will mature June 1, 1968. Since the last sale of bonds in 1909 the company has acquired additional properties so that the collateral security on deposit is stocks, bonds, and certificates of indebtedness amounting to more than $84,400,000. There are also pledged, subject to the lien of the company's $7,000,000 mortgage of Oct. 1, 1895, securities and stocks of a par value of $11,605,000, making a total of about $96,000,000 of collateral. Against this is, the company says, only a charge of $3,459,000 of the refunding 4 per cent bonds outstanding.

Accident Cuts West India Net

The total receipts of the West India Electric Company, Ltd., Kingston, Jamaica, for the calendar year 1917 were $287,210, as compared to $286,321 for 1916, an increase of $889. The railway receipts totaled $196,409, a gain of 80 per cent. The total operating expenses, however, increased from $144,064 to $159,189, with resulting net profits of $128,020 in 1917 as compared to $142,257 in 1916. The large increase in operating expenses, which was responsible for the reduction of net profits, was entirely due to accident claims arising from a serious collision.

After the payment of fixed charges of $49,909, there remained a net income of $78,111 or 9.76 per cent on the capital stock. In each preceding year since 1910 the percentage of net income to capital had been more than 10 per cent, with the exception of 1912, when it was 9.37 per cent. Four quarterly dividends amounting to $40,000 were paid in 1917.

The property and plant account in 1917 showed an increase of $7,142. The number of passengers carried in 1917 was 4,825,737, an increase of 12,983 or 2.7 per cent. The operating ratio was 55.42 per cent in 1917 as compared to 50.31 per cent in 1916.

Remarkable Progress in Shanghai

The street car service in the International Settlement of Shanghai was inaugurated ten years ago under British management. The remarkable increase in receipts—despite the fact that the tracks have not been extended, and despite the sweeping reduction in receipts per passenger from $0.0193 gold in 1909 to $0.0086 gold in 1917—is shown by the following summary for 1909 and 1917:

	1909	1917
Number of cars	65	167
Number of pasengers	11,750,000	73,500,000
Receipts	$226,970	$631,953
Receipts per passenger	$0.0193	$0.0086
Royalty to Municipal Council	$11,048	$31,471

The fares in Mexican currency are $0.03 for first class and $0.015 for third class for each section, the sections averaging about seven-tenths of a mile in length.

Effort to Reclaim Road

Section of Taunton & Pawtucket Street Railway, Sold for Junk, May Be Saved

Plans are under consideration at Attleboro, Mass., for the purchase by the city of the section of the Taunton & Pawtucket Street Railway from Briggs Corner to Attleboro, and for its operation for the benefit of residents of the district served by this line.

The property as a whole was sold at auction in November, 1917, to the Swift-McNutt Company, Boston, and the road is now being dismantled with the exception of the section above mentioned. It consists of about 17.5 miles of single track, and the average gross revenue has been about $50,000 a year.

The original property was the Bristol County Street Railway, organized about eighteen years ago. This went into the hands of a receiver in 1905, and friendly interests reorganized it soon after as the Taunton & Pawtucket Street Railway. Bond interest was paid up to 1909, but since then the property has been struggling to keep out of the hands of a receiver, being run under the consent of the bondholders.

Following the sale last fall to the Swift-McNutt Company, an application was made to the Federal Court to approve the taking over of the road by Swift-McNutt. This was issued a few weeks ago. Operation of the road ceased in March. The proposed purchase of the branch line by the city of Attleboro involves a plan for the assessment of 5 per cent annually on abutters until half the purchase price is paid. The wrecking firm now owning the property will await the settlement of this matter before dismantling the Briggs Corner-Attleboro section.

Financial News Notes

Immediate Payment Not Required.—Judge Dodge of the United States District Court at Boston has denied the application of the State Treasurer requiring the immediate payment of the 1917 franchise tax of the Bay State Street Railway, Boston, Mass., amounting to $81,467 with 12 per cent interest.

Dissolution Proceedings Ended.—Justice Irving G. Hubbs in the Fifth Judicial District of the New York State Supreme Court has signed an order winding up the dissolution proceedings of the Empire United Railways, Inc., Syracuse, N. Y., the property of which was sold under foreclosure some months ago.

Usual Philadelphia Company Divided.—The Philadelphia Company, Pittsburgh, Pa., which controls the Pittsburgh Railways and other utility

properties, on April 29 declared the usual quarterly dividend of 1½ per cent on the common stock, payable on May 15 to stockholders of record of May 2. The directors acted at a postponed meeting, as the usual time for voting on the dividend was a fortnight ago.

Chicago & West Towns Earnings.—The gross revenues of the Chicago & West Towns Railway, Chicago, Ill., for the calendar year ended Dec. 31, 1917, amounted to $587,292. The operating expenses and taxes totaled $413,597, leaving net revenues of $173,694. Interest on bonds amounted to $33,360, and interest on bills payable and rentals to $6,438, with the result that the net income totaled $133,896.

Another Road on the Scrap Heap.—Announcement has been made that the rails, poles, wires and cars of the Denton (Tex.) Traction Company, operating 4.5 miles of road, have been sold to a junk company and the task of demolishing the system is expected to begin shortly. The Denton Traction Company began the operation of cars in the fall of 1907, but last January the management decided to discontinue the service.

Indianapolis Net Falls.—The gross earnings of the Indianapolis Traction & Terminal Company, Indianapolis, Ind., for the calendar year 1917 totaled $3,654,683, an increase of $15,725. The operating expenses, at $2,212,012, showed an increase of $146,883. The net earnings from operation, therefore, amounted to $1,442,620, a decrease of $131,159. There was expended for maintenance of track and roadway and equipment in 1917 the sum of $611,273, as compared to $605,737 in the preceding year.

Will Abandon Part of Its Line.—The Connecticut Valley Street Railway, Greenfield, Mass., has announced its intention to abandon its line between Turners Falls, Millers Falls and Montague on July 1. The company feels that it cannot be expected to maintain service on the line which shows inability to meet operating expenses alone, to say nothing of any return on the investment.

Even in Enemy Territory.—The Munich correspondent of a Zurich, Switzerland, paper, in referring recently to local conditions in Munich, said: "Not only is the inefficient housing, especially for the middle class, a calamity, but the street car fares are so high. There are increases up to 40 per cent, and a 10 pfennig trip is a thing of the past. They figure on increased receipts of at least 2,500,000 (pfennig). The new fare is in effect on April 1."

Subscriptions to New Cleveland Stock.—The Cleveland (Ohio) Railway is reported to have received subscriptions for stock to an amount sufficient to pay its debt of $1,230,000 and pay for all the extensions and other additions to the property that the company will need this year. While the stock has not all been taken by the stockholders, it is said that it is not likely that the company will offer any of the stock to the public until after the close of 1918.

Successor to Cincinnati, Dayton & Toledo Incorporated.—The Cincinnati & Dayton Traction Company, Cincinnati, Ohio, has been incorporated with capital stock of $1,250,000, by J. M. Hutton, Leo Van Lahr and others. This is to be the successor to the Cincinnati, Dayton & Toledo Traction Company, the property of which was sold under foreclosure recently to the representatives of the bondholders. An outline of the terms of the reorganization was published in the ELECTRIC RAILWAY JOURNAL for April 13, page 723.

Interest Payment Deferred.—F. D. Carpenter, president of the Western Ohio Railway, Lima, Ohio, which operates 112 miles of road, notified holders of the company's first mortgage 5 per cent bonds that it would be unable to pay the interest on these bonds due on May 1 and that it would defer payment until Sept. 1. Holders are requested to forward coupons for collection at that time. It is explained that the severe operating conditions of the past winter with the resultant interruptions to service and the increase in the cost of operation made it impossible for the company to accumulate its usual monthly reserve for the payment of interest.

Temporary Extension of Commonwealth Bonds.—The Commonwealth Power, Railway & Light Company, Grand Rapids, Mich., had $8,081,000 of 6 per cent convertible bonds falling due on May 1. No arrangements had been made for the paying off of the bonds on the above date other than application to the War Finance Corporation for an advance to meet the retirement of the bonds. Anton G. Hodenpyl, president of the company, in a letter addressed to the holders of the bonds, asked that they withhold presentation of the bonds on the date of maturity, as it was not expected that the War Finance Corporation could take action on the matter in such a short time. Coupons were paid on May 1, and bonds will continue to draw interest up to the time they are redeemed.

Western Pacific to Operate Tidewater Southern.—The operation of the Tidewater Southern Railway, Stockton, Cal., has been taken over by the Western Pacific Railroad, which heretofore controlled the company through stock ownership. Under the new plan of operation, Byron Bearce, president; J. C. Linaberry, superintendent, and J. C. Lindsey, chief engineer, are no longer connected with the properties. The system is being operated as before, the personnel changes being chiefly in the executive department. C. M. Levey, president of the Western Pacific Railroad, is acting as head of the newly-acquired electric system, and for the present the remainder of the staff consists of C. B. Hotchkiss, auditor and treasurer, and E. L. Gamble, general manager. Mr. Gamble continues in his former position with the Northern Electric Railway.

Electric Railway Monthly Earnings

** ATLANTIC SHORE RAILWAY, SANFORD, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$8,261	*$11,696	†$3,435	$422	†$3,857
1m., Feb., '17	22,040	21,381	659	667	†8

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO

1m., Feb., '18	$35,396	*$26,499	$8,897	$11,319	†$2,422
1m., Feb., '17	32,361	*21,591	10,771	11,435	†664
2m., Feb., '18	76,169	*54,473	21,696	22,640	†944
2m., Feb., '17	68,798	*43,724	25,074	22,873	2,201

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.

1m., Feb., '18	$36,294	*$28,999	$7,295	$6,534	$761
1m., Feb., '17	32,010	*19,445	12,565	6,552	6,013
12m., Feb., '18	471,213	*317,849	153,364	78,618	74,746
12m., Feb., '17	401,499	*236,151	165,348	78,451	86,897

COLUMBUS (GA.) ELECTRIC COMPANY

1m., Feb., '18	$96,461	*$38,811	$57,650	$32,255	$25,395
1m., Feb., '17	80,087	*30,744	50,243	28,414	21,829
12m., Feb., '18	1,130,911	*436,953	693,958	366,316	327,642
12m., Feb., '17	915,378	*356,985	558,393	343,142	215,251

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m., Feb., '18	$1,619,202	*$1,154,493	$464,709	$478,854	†$14,145
1m., Feb., '17	1,530,735	*925,409	605,326	430,917	174,409
12m., Feb., '18	19,894,954	*12,893,881	7,001,073	5,382,618	1,618,455
12m., Feb., '17	17,340,513	*9,696,593	7,643,920	5,076,403	2,567,517

GRAND RAPIDS (MICH.) RAILWAY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$102,091	*$76,699	$25,392	$19,270	$6,122
1m., Feb., '17	103,932	*73,700	30,232	17,392	12,840
12m., Feb., '18	1,296,559	*917,866	378,693	222,487	156,206
12m., Feb., '17	1,305,380	*847,091	458,289	193,341	264,948

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH

1m., Feb., '18	$26,644	*$19,126	$7,518	$5,075	$2,443
1m., Feb., '17	25,249	*17,635	7,614	5,183	2,431
12m., Feb., '18	345,198	*219,814	125,384	61,042	64,342
12m., Feb., '17	331,399	*189,658	141,741	63,279	78,462

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY

1m., Feb., '18	$24,721	*$18,195	$6,526	$7,901	†$1,375
1m., Feb., '17	25,550	*18,830	6,720	7,180	†460
12m., Feb., '18	302,759	*233,497	69,262	91,766	†22,504
12m., Feb., '17	312,229	*222,382	89,847	86,314	3,533

SAVANNAH (GA.) ELECTRIC COMPANY

1m., Feb., '18	$85,198	*$56,906	$28,292	$24,382	$3,910
1m., Feb., '17	69,295	*42,645	26,650	23,565	3,085
12m., Feb., '18	1,002,397	*672,128	330,269	292,499	37,770
12m., Feb., '17	843,910	*559,154	284,756	284,061	695

** On May 1, 1917, the Atlantic Shore Railway was divided east and west of York Beach, Me., the western end passing to the operating control of the Portsmouth, Dover & York Street Railway. Figures for the first four months of 1917 are for the entire system. Beginning with May 1, figures for the Atlantic Shore as at present constituted are given. a Includes $140,707 for depreciation, in addition to $40,000 charged in the monthly statements. No depreciation included in 1916 operating expenses. † Deficit. * Includes taxes.

Traffic and Transportation

Toronto Fare Increase Lost

Investigators See the Need for More Revenue, but Politicians Apparently Unwilling to Assume Responsibility

The battle of the fares is in progress in Toronto, Ont., on the Civic Railway. One side proposes, but the other fails to dispose. Meanwhile the deficit keeps piling up. Ever since the Civic Railway was placed in operation in 1912, the fares have been notoriously low.

Two-Cent Cash Fare

The road consists of only 20 miles of line, but a cash fare of 2 cents or six tickets for 10 cents prevails. This was urged as too low from the beginning by the Commissioner of Works, but the City Council refused to act. In 1913 the Commissioner again recommended an increase in fares. This time he suggested that the municipal lines charge the same rate of fare as the Toronto Railway. But no action followed. The process has been repeated from time to time since, but the proposal to secure more revenue has always gone down to defeat.

The latest refusal of relief occurred only a few weeks ago. It followed the presentation of a report recommending fare increases and other changes which was presented by T. Bradshaw, commissioner of finance, and R. C. Harris, commissioner of work, who also has charge of the construction and operation of the Civic Railway. The board of control sent the report of Messrs. Bradshaw and Harris on to the City Council, advising that the recommendations did not meet with its approval and the City Council acquiesced, so the fares remain as they were before. In this report the Commissioner of Finance and the Commissioner of Works said in part:

Ratepayers Taxed to Make Up Losses

"Since the institution of the various civic car lines, the ratepayers at large, up to Dec. 31, 1917, were called upon to pay $590,688 for special service accorded those in the districts contiguous to the civic lines. As before reported, it cannot be urged that this practice is sound, wise or business-like. Every public utility should be made self-supporting. It is unfair that the citizens at large should be compelled to make good annually, through the tax rate, the deficit created by reason of preferential treatment accorded a section of the community. Furthermore, it provides one of the most potent and damaging arguments against public ownership. We should persistently hold in mind the necessity of conserving every financial resource, against the acquisition of the Toronto Railway, forty-three months hence. We are neither conserving nor prudent in furnishing service below cost. In our opinion such policy is unwise and dangerous, inasmuch as it may have some serious collateral bearing upon the 1921 situation.

"We recommend that the fares on the civic car lines be 3 cents cash, or ten tickets for 30 cents; children's fare to be 1 cent cash, as at present; the foregoing rates to apply from 5.30 a.m. to 12 o'clock midnight; night fares from 12 midnight to 5.30 a.m. to be 5 cents cash, as at present. We estimate that the recommended scale of fares will be sufficient to cover the operating, maintenance and capital charges, but not physical depreciation, or municipal taxes, which, in our opinion, should be collected from every public utility, operated municipally or otherwise. If this scale be adopted, the following statement, based upon the number of passengers carried in 1917, and the service provided for in the estimates of 1918, would approximate the situation at the end of this year, viz.:

Operating and maintenance charges	$325,624
Capital charges	171,064
Total	$496,688
Revenue passengers..16,478,391 at 3 cents a passenger	494,351
Deficit	$2,337

"We cannot too strongly urge upon the administration to give effect to this recommendation. In our opinion it embraces good finance, sound business and efficient administration."

Consolidation Suggested in Trans-Bay Rate Case

A consolidation of the San Francisco-Oakland Terminal Railways, the Key Route, and the electric system of the Southern Pacific Company on the east side of San Francisco Bay was recommended by the engineering department of the Railroad Commission of California in the continuation of the transbay rate case recently heard in San Francisco. The consolidation of the two systems, eliminating parallel lines, it was asserted, would affect an annual saving of $600,000 to $700,000 if consent of the cities involved could be secured for the required changes. If the lines had been consolidated in 1916, engineers for the commission contend that there would be a profit of $595,700 instead of a deficit of $41,368 as claimed by the companies.

The report of the commission engineers also contained the suggestion that if a consolidation is not effected, savings can still be made by eliminating duplicate service. Discussion of whether the Railroad Commission has authority to fix rates on roads under government control did not result in a decision on this point up to the time of adjournment.

Comment on Springfield Cars

Brief Review of Ideas Expressed by Massachusetts Commission in Its Recent Zone-Fare Decision

In the article published in the ELECTRIC RAILWAY JOURNAL of April 6, page 663, reviewing the decision of the Public Service Commission of Massachusetts with respect to zone fares in Springfield, Mass., brief reference was made to the matter of car equipment. In general, the commission favored the improved practices recommended by Prof. A. S. Richey, Worcester, Mass., whose report was abstracted in this paper for Jan. 2, 1917.

One-Man Experiment Suggested

While the commission did not approve the suggestion of John P. Fox, expert for the city of Springfield, that the existing cars be quite generally operated by one man, by closing up the rear door and making other changes, it did say that with cars properly designed for the purpose, the principle of trailer operation was sound. The commission was not convinced, upon present evidence, that the use of these old cars in the manner suggested was either safe or otherwise desirable. It suggested in this instance that it would do no harm, however, to prepare one car for such use in order that careful tests might be made.

On the general subject of rolling stock the commission said that the company needed more cars and it should also provide for the gradual replacement of rolling stock of obsolete types with more modern and economical equipment. On certain lines, either trailers or two-car trains with multiple-unit control could be operated with economy and to general public advantage.

In the course of the proceedings there was much discussion of the one-man car. Mr. Fox's suggestion that existing cars be quite generally operated with one man, by closing up the rear door and making other minor changes, was not indorsed by the commission on account of the heavy traffic and the present accident record of the company, but it is said that, clearly, one-man car operation deserved very serious consideration on the part of the company.

One-Man Cars Might Do Here

The commission said there were lines in the Palmer division on which the service was now very infrequent and inferior, where one-man cars would probably give better accommodation at lower expense, and this was true of the Westfield division and doubtless of certain lines in the Springfield division. It was also possible that the company might have cars which could be reconstructed satisfactorily for this purpose at relatively small expense, without investing in wholly new equipment. The commission strongly advised that this question receive immediately and careful attention.

Seattle's Traffic Problem

Unprecedented Industrial Activity and Man Shortage Complicate City Railway Transportation

Following a public assertion by Mayor Ole Hanson, Seattle, that railway service in Seattle has "broken down," A. W. Leonard, president of the Puget Sound Traction, Light & Power Company, declares that Seattle is getting a larger measure of service than ever before and that what has taken place in the city is in reality a fundamental and entirely unexpected change in the direction of service, together with a shift in industrial population.

According to statistics of the company, the railway system is carrying more passengers now, furnishing more passenger car miles of service, and paying a larger volume of wages than ever before in its history. In March, 1916, 7,450,686 passengers were carried; in March, 1917, 8,139,633 passengers, and in March of this year 9,573,725 passengers.

Mr. Leonard said in part:

"While it is true that there is rush-hour congestion and probably always will be, it is not true that our service has broken down. We carry more persons in a shorter time in the morning than formerly, and do it as well as the circumstances will permit. It must be remembered that a large part of our equipment, representing an investment of millions of dollars, can be used only for rush-hour service and that it is in use one-eighth of each working day and idle seven-eighths of the time.

"What we are doing in the aggregate is to furnish 20 per cent more service and carry 30 per cent more load than two years ago, and the service increase would be as great or greater than the load increase if it were possible to get more men to take out more cars.

"In February last, for instance, eighty-seven men entered our train department service, and 106 men left it. Electric railways here or elsewhere cannot pay shipyard wages. The government carries the shipyard load. We carry our own, and have to get the revenue to do it from the car riders."

Jitney Regulation Up to City

The Legislative Assembly of British Columbia on April 22 gave the city of Vancouver power to prohibit the operation of jitneys within the city either on city routes or on the interurban route to New Westminster. This is the first step towards the carrying out of the recommendations of Dr. Adam Shortt, who reported last November on the electric railway situation and with whose decision the city of Vancouver and the British Columbia Electric Railway agreed to abide, following a strike of the railway men last June.

The British Columbia Electric Railway took no part in the proceedings before the Legislature. The city arrayed itself against the jitney interests. Formerly the city had refused to take any action against the jitneys, but on the ground that it would be a breach of faith not to carry out the agreement, the City Council carried its own case to the Legislature. Attempts were made to bar competition only on streets where there are car lines and to exclude from the proposed charter powers the elimination of interurban jitneys. These amendments were voted down.

It now remains for the City Council of Vancouver to pass a by-law prohibiting the operation of jitneys. This it is expected will be done within a few weeks. It will mark the end of a long fight, first, for regulation, which failed to fructify, and, then, for the elimination of jitneys as an economic factor. The fight for elimination started when jitney competition and increasing prices led to the suspension of service last June at the time the electric railway employees struck for higher wages.

Virginia Lines Seek Relief

Make General Statement to State Corporation Commission Reciting Their War-Time Burdens

A committee representing eighteen electric railways, fifteen gas companies, thirty-two water companies and sixty-four electric light and power companies serving 1,750,000 people in Virginia appeared before the Corporation Commission of that State during the week ended April 27 with the request that the commission consider the burdens which have been placed upon such corporations.

The members of the special committee representing the public utilities included Thomas S. Wheelwright, president of the Virginia Railway & Power Company; Herbert W. Jackson, president of the Virginia Trust Company; B. B. Ferguson, president of the Portsmouth Gas Company, and John W. Hancock, general manager of the Roanoke Railway & Electric Company and the Lynchburg Traction & Light Company.

The committee explained that because of the unprecedented increase in operating expenses and maintenance costs, many of the utilities have been forced to reduce or abandon entirely the payment of dividends; that others face this necessity in the near future, and that still others may become bankrupt. In continuing the committee said:

"At the present time it is impossible for the utilities to get money with which to maintain their properties, or to refund maturing debts, except at ruinous interest rates. These conditions are halting the development of the utilities and make it necessary for the companies to appeal to the State and municipal authorities for increases in rates sufficient to maintain their credit and efficiency.

"If relief is not granted the utilities will be unable to meet the requirements of the government or the needs of the local communities which they serve, the security holders will lose heavily and the employees will suffer."

St. Louis Fare Brief In

Case Regarded by the Company as Imperative, but No Specific Rate Asked

Attorneys for the United Railways, St. Louis, Mo., on April 22 filed a brief with the Public Service Commission of Missouri in the company's application for increased revenue. The brief states that the application is for an "order authorizing the applicant to make such additional charges for the transportation of passengers as will enable it to meet its necessary expenses for 1918 and pay a fair return on the investment in the property."

It is pointed out that no particular form of relief was requested in the formal application, "but the evidence for the applicant suggests that relief may be given, either by increasing the 5-cent fare or by charging for transfers, or by a combination of these methods."

The brief points out that the movement for increased revenue for electric railways in the United States is almost universal, and that applications for such increase have been made by 119 such companies since last fall.

The brief outlines the company's theory for the request as follows:

"Applicant's theory is that its receipts will be curtailed by $371,453 and its expenses increased by $2,674,188 as compared with 1917, resulting in a deficit of $2,452,794 in the payment of interest on bonded indebtedness and a deficit of $3,529,564 in the payment of a 6 per cent return on the agreed valuation of $60,000,000; or, to put it another way, after paying operating expenses (including increased costs) there will be only $70,435 available for return on investment."

The brief repeats the statement made when the commission held its hearing to the effect that unless relief is granted, the Union Depot line bonds, maturing June 1, cannot be taken up, and these lines will revert to the original owners, and become in all probability a separate and distinct system.

Fair Warning Demanded

The Board of Public Utility Commissioners of New Jersey has instructed public utility corporations that they must notify the commission of all rate increases fully twenty days before they are to go into effect, together with all data relative to the same. The annnouncement of the commission follows:

"Before any public utility owning, operating, managing, or controlling any street, gas, electric light, power, sewer, water, or telephone plant or equipment for public use with the State of New Jersey, shall increase any existing rate or schedule, or change or alter any existing classification, the said public utility shall, at least twenty-days prior to the date when it is proposed that the said increase change or alteration shall become effective, give written notice to the Board of Public Utility Commissioners."

New York Transfer Cases Adjourned

Companies Urge Possibility of Transfer Relief, but Commission Is Still Considering Jurisdiction

The Public Service Commission for the First District of New York has either dismissed or adjourned indefinitely the various fare cases that have been pending before it for nearly a year. After the decision in the Rochester fare case, the commission dismissed the higher unit-fare applications of the Staten Island Midland Railway and the Richmond Light & Railroad Company, and it asked the companies concerned in the 2-cent transfer cases whether in their opinion it could proceed further on their applications. After hearing argument on this point, the commission has now adjourned the transfer cases subject to call upon its decision as to jurisdiction.

Transfers Can Be Regulated

In asking for the opinion of the railways as to available means of relief, counsel for the commission expressed the opinion that the transfer cases could not be continued on a rate basis, in connection with system valuations. Alfred A. Cook, attorney for the Third Avenue Railway, averred that the Rochester decision does not prevent the commission from establishing charges for transfers at certain points on the Third Avenue lines between different operating companies. The reason is that the franchises of these companies do not contain any restrictions regarding transfers, and the commission, under its power to establish joint rates, can abolish the transfers or establish a charge for them.

James L. Quackenbush, general attorney New York Railways, explained to the commission that no legal obligations exist for the continuance of many of the transfer points in New York City. In connection with litigation regarding penalty actions, the city companies established many transfer points as a matter of expediency. In general, in Mr. Quackenbush's opinion, the commission has plenary power over statutory transfer obligations. Henry J. Smith mentioned various parts of the New York Railways System where transfers can be abolished or charged for. He suggested that the commission give as much transfer relief as is in its power but then leave the question open for a short time, in order that the city may waive some existing franchise restrictions and thus secure a uniform transfer structure.

Few B. R. T. Restrictions

A. M. Williams, counsel for the Brooklyn Rapid Transit Company, said that there are only a few places on his system where the franchises prescribe transfers. Most of the transfers exist under an order of the commission in 1914. The commission can abrogate this order or modify it so as not to require the issuance of transfers at certain points except upon the payment of 2 cents. The Brooklyn system has 751 intersections of lines of the same operating companies and 1082 intersections of lines of different operating companies. According to Mr. Williams, the commission can charge for transfers at all of the latter points and at most of the former.

Ernest Baldwin, special counsel for New York City, said that the law provides for the payment of one fare for a continuous ride, and that no one short of the Legislature can change the statutory provision to this effect. Moreover, he pointed out that the commission would not be permitted to discriminate by imposing transfer charges at some points and not at others.

Pending a formal statement by the commission in an electric railway case, the best indication of its feeling in regard to the Rochester decision is given in its Bronx Gas & Electric Company opinion approved on April 18. In discussing the Rochester decision in this case, the commission said in part:

How Commission Interprets Rochester Decision

"A rate fixed by a special statute, passed before or after the public service commission law, remains subject to commission revision, downwards or upwards, unless the Legislature has, by the public service commission law, specifically and clearly withheld the power to increase the rates of a particular class of utility above the maximum fixed by such a statute."

According to the commission, five members of the Court of Appeals preferred to join in deciding what the Legislature has done rather than undertaking to decide in advance what it might do, namely, whether a specific delegation of power to prescribe rates notwithstanding the limiting provisions of franchises would be construed by the court to confer validly and effectually any power on the commission to deal with rates fixed by franchises granted under the *aegis* of the Constitution. Continuing, the commission said:

"The question of the possible limits of legislative power with respect to the rates fixed in such contracts the learned court expressly declines to decide unnecessarily, but at least until such time as the Legislature may undertake to confer broadly upon the commission the power to prescribe what rates are reasonable, even in excess of those fixed by franchise agreements, the commission, in the absence of a modification of the contract or the city's consent, has no power to take action looking to an advance in any rate above the franchise figure.

"The ordinary regulative power of the commission may at any time be availed of, on a proper showing of facts, to reduce any public utility rate, even if that involves the fixation of a rate for such utility service below the rate fixed or authorized by the company's franchise; but if the public utility has obtained the valuable right to use public streets by agreeing to maintain, at the city's option, a stipulated fare, the regulative power cannot raise that fare above the contract figure without the city's consent."

A meeting of the New York Electric Railway Association was held in New York on April 29 to receive the report of the committee appointed a year ago to consider ways and means of securing increased revenues in New York State. The report was accepted, and the committee was instructed to proceed with its work along such lines.

Step in Auto Regulation

California Railroad Commission Makes Another Advance Toward Putting Autos on Regulation Basis

The Railroad Commission of California has ordered that within four months from April 1 all public automobile stages shall either own their equipment or lease it for a specified amount on a trip or term basis, the leasing of equipment not to include the services of a driver or operator. All employment of drivers or operators of leased cars is to be on the basis of a contract by which the driver or operator shall bear the relation of employee to the transportation company engaging them. The practice of leasing equipment or employing drivers or operators on a percentage basis is prohibited.

The order of the commission is the result of its investigation. A number of automobile stage line owners or managers were brought before the commission at public hearings in Los Angeles and San Francisco. The commission says that the practice of leasing cars on a percentage basis is not desirable from a standpoint of public necessity, and does not tend to put the industry on a suitable basis. Where the entire upkeep of the car falls on the lessor, the public does not receive proper service, nor does the car owner receive just returns. Stage companies or lessees have in many cases been practically relieved from all responsibility for maintenance or operation and have acted merely as ticket agencies or brokers. These companies or associations have claimed the ownership to operate routes exclusively, and their conduct has sometimes been the cause of poor service to the public and poor compensation to the actual owners and operators of automobiles for them.

Appeal in Transfer Order Case

L. Edward Herrmann, counsel of the Board of Public Utility Commissioners of New Jersey, has filed in the Court of Errors and Appeals a supplemental brief in the appeal of the borough of Bradley Beach from the decision of the New Jersey Supreme Court in the case of the Atlantic Coast Electric Railway against the Utility Commission and the borough of Bradley Beach.

In this rate case the Supreme Court

decided that the Utility Commission had not the power to compel the railway to issue transfers from one line to another on its system and upon this reasoning set aside an order of the commission. The borough of Bradley Beach had an ordinance under which it sought to enforce the transfer arrangement with the railway, and the commission held that the terms of the ordinance were to be carried out.

Justice Trenchard, who wrote the opinion of the Supreme Court, declared that "this ordinance, with its acceptance and action thereunder by the railway, being to constitute a contract between the company and the municipality, it is incompetent for the Board of Public Utility Commissioners, just as it is incompetent for the municipality itself, to violate that contract by imposing upon the company an additional burden, the effect of which is to require it to carry passengers for the same fare, not to, buy beyond," a certain point.

Increase for Resort Road

Railway at Ocean City, N. J., Operated Only Four Months a Year, Will Charge Seven-Cent Fare

The Board of Public Utility Commissioners of New Jersey has granted, subject to challenge, the request of the Ocean City Electric Railroad to increase its fares from 5 cents to 7 cents. The request was made by William G. Moore, president of the railway. The company operates a 10-mile road in Cape May County during June, July, August and September. It is one of the few roads which cease operation during the winter. A peculiar fact is that the franchise of the company does not contain any provision as to the rate of fare to be charged.

In the application to the regulatory commission, President Moore of the company said:

"During the seasons of 1914, 1915 and 1916 the income was scarcely sufficient to provide for the operating expenses, taxes and depreciation, and it left no return whatsoever upon the invested capital of the company. The company would have found it impossible to operate the road had not one of the stockholders of the corporation, from time to time, advanced his own money to pay the interest upon the bonds and to meet deficits accruing from operation. We cannot borrow any more money from the same source to meet the future expenses. The funded debt consists of $75,000 of 5 per cent bonds. On Dec. 8, 1916, the company owed $196,693 for money advanced. It has outstanding $100,000, par value, of capital stock, on which no dividend has ever been paid. The company cannot operate the road during the present season unless it is allowed to charge a higher rate of fare."

The road can now charge 7 instead of 5 cents until the municipality of Ocean City challenges its right. In that event a hearing would have to be given.

More Zone Fares for Massachusetts

Commission in That State Approves This Plan of Fares for Forty-two Mile System With Athol as Its Center

An order approving the establishment of a zone system of fares for the Northern Massachusetts Street Railway was issued on April 30 by the Public Service Commission of Massachusetts. The road operates about 42 miles of track and serves the Athol-Gardner district, with a line to the outskirts of Fitchburg. There is a branch about 11 miles long running from East Templeton through Baldwinville to Winchendon. The company is controlled by a voluntary association known as the Massachusetts Consolidated Railways, which also controls the Connecticut Valley and Concord, Maynard & Hudson street railways.

At present the system is divided into twelve fare zones with a 5-cent fare unit. The company's new schedule, now approved, proposes to divide the line into zones of about 1 mile each, to charge a fare of 5 cents for the first three zones or less, and 2 cents for each additional zone. It is also proposed to issue ticket books with 150 coupons for $2.80, each coupon good for travel within one zone, except that at least three coupons will be detached for each ride.

ENTITLED TO 6 PER CENT RETURN

The financial investigation of the commission leads the board to conclude that the investment which may properly be used as the rate base is about $1,150,000. In accordance with the principles which the commission has laid down in previous cases, taking into consideration the risk of the enterprise, the company is entitled, states the decision, to a return of at least 6 per cent upon the foregoing amount, without any deduction for depreciation, unless failure to make provision for it is due to the payment of unwarranted dividends, or is otherwise attributed to mismanagement. The average annual dividend paid during the entire period prior to the consolidation was about 3⅞ per cent, and since consolidation (1912-1917) the average rate is slightly more than 2 per cent. A large deficit has been accumulated, and unearned dividends have been paid. Maintenance, renewals and depreciation have been neglected.

The commission holds that at least $50,000 a year, which is 20 per cent of the railway's gross earnings, is necessary to provide for current maintenance and depreciation. The operating expenses and taxes for 1917, exclusive of maintenance and depreciation charges were $162,215. A charge of at least $50,000 as stated, is necessary for maintenance and depreciation and an additional charge of $69,000 is required to pay a 6 per cent return upon the investment value above set. Upon this basis the company appears to be entitled to a total revenue of $270,215. Owing to the trend of prices for fuel, labor and supplies, the board says this figure should be increased for 1918 to at least $275,000. As the total income of the company for 1917 was $247,407, the road is fairly entitled to an increase of about $27,500 in its gross revenue through a readjustment of fares.

The only opposition offered at the hearings was directed to three subsidiary matters. One of these affected the loop line in Gardner. The patrons there asked the option of traveling to Gardner Center by alternative routes upon the payment of a 5-cent fare. The commission found no good reason for such a privilege, which involves using a more circuitous route and a transfer, with no greater frequency of service than by the direct route. Certain residents of Westminster objected to a fare limit established by the company, but the number was so small that the commission did not feel warranted in extending the zone length to 1.4 miles in this case, pointing out that there was little justification for overlaps when the increase of fares in successive zones is only 2 cents instead of 5 cents.

The other feature of the proposed tariff to which objection was raised, was the abolition of the workingmen's tickets, which were available during certain hours of the day between Orange and Athol. These tickets were sold in books of forty for $1.25, or at the rate of 3⅛ cents each. As there were two fare zones between Orange and Athol, the ticket fare between these points was 6¼ cents as compared with a cash fare of 10 cents. In the form in which the tickets were now issued they could also be used by passengers riding in one fare zone only, thus reducing the minimum fare from 5 cents to 3⅛ cents. The commission said that this particular objection could be easily obviated by having the books made up of twenty tickets with two coupons each, but the company in its schedule withdrew the tickets entirely.

These tickets were put in operation many years ago by the Athol & Orange company when it was operated as a separate company, but were retained by the present management. No similar tickets are available between other points of the Northern Massachusetts system. The commission was of the opinion that this ticket rate under present conditions was too low to afford a reasonable compensation to the company and that it might also be regarded as constituting a discrimination against other communities served by the company.

As the proposed fare schedule is on a radically different basis from the one previously employed, it was difficult to make an accurate estimate in advance of the increased revenue which would be likely to result from its adoption. Certain fares under the new schedule will be upon a lower basis than at present and some decrease in riding is to be anticipated between certain points where

the fares have been increased. In view of these facts and in the light of the revenue results from the recent adoption of a similar system of fares by other companies, the commision was satisfied that the actual increase in revenue under the schedule filed would be well within the limit of the amount to which the company appeared to be entitled.

Rhode Island Zoned on May 5

The Public Utilities Commission of Rhode Island on April 29, at the request of the Rhode Island Company, extends to May 5 the time for the beginning of operation of the zone system.

The new system was to have gone into effect on May 1, but the time to get the details into working order was found insufficient and the extension of five days was asked for and granted. The company also filed with the commission the definite locations of the ends of the intermediate zones, which were only approximately fixed in the act passed by the General Assembly.

The company has adopted a "coin" system for use in the collection of the 2-cent increment in fares. The coins will be considerably larger than a cent, with a hole in the center. They will have a face value of 2 cents. After collecting a 5-cent fare the conductor will sell these disks, which can be collected in the Rooke register now in use. On one side the coin will read: "Two-cent zone ticket—the R. I. Co." On the other it will read: "Good only on continuous ride after 5-cent fare has been paid."

Staggered Stops for Whole City

The United Railways & Electric Company, Baltimore, Md., is gradually installing the staggered skip stop on its entire system. On April 7 it became effective on the Harford Avenue, York and Frederick Road lines; on April 14 on the Edmondson Avenue line; on April 18 on the Madison Avenue, Emory Grove, North Avenue, Garrison Boulevard, Linden Avenue, Woodlawn and West Arlington lines; on April 21 on the St. Paul Street, Boulevard, Carey Street and Gilmor Street-Guilford Avenue lines; on April 25, Wilkins Avenue, Preston Street, Federal Street and Ellicott City line and on April 28, Gay Street.

At present the stops are indicated by cardboard signs marked, East, West, North or South stop. These will be replaced as soon as possible by the same legends painted on the trolley poles. The change in stops was introduced by a description in *Trolley News* of the staggered skip stop and its relation to fuel conservation as set forth in correspondence between the United States Fuel Administration, the Maryland Fuel Administrator and the Public Service Commission. For the present, the cars will be run without changing the schedules. This will save fuel by permitting a large increase in coasting.

Zone Rates for Springfield

The Public Service Commission of Massachusetts has approved the detailed plans of the Springfield Street Railway for a zone system of fares worked out in harmony with the recent decision of the board sanctioning a rate increase.

With the exception of the Indian Orchard district substantially all of the city of Springfield will be located within the 5-cent fare zone. This zone will terminate at Pine Point on the Indian Orchard line, the 6 2/3-cent zone ending at Harvey Street and the 8 1/3-cent zone at the end of the line. On the Westfield line the 5-cent zone going out of Springfield extends to Silver Street; a second 5-cent zone thence extends to the Westfield line, and in Westfield a 6-cent fare becomes effective. On the interurban line from Westfield to Holyoke the copper zone schedule of 2 cents per mile becomes effective at St. Mary's Cemetery, and on the Westfield-Huntington line it begins at the Huntington town boundary.

H. M. Flanders, general manager of the Springfield company, stated in a recent press interview that the new rates would go into effect on May 1.

The decision of the commission in this case was reviewed in the ELECTRIC RAILWAY JOURNAL of April 6, page 663.

Transportation News Notes

Toronto Company Fined.—The Ontario Railway & Municipal Board imposed on the Toronto Railway a fine of $1,000 a day for twenty-four days, making a total of $24,000, for failure to place 100 new cars on its lines as ordered by the board more than a year ago.

Los Angeles Has a Woman Conductor.—The Los Angeles (Cal.) Railway is experimenting with a woman conductor recruited from among the company's office help. This is believed to be the first instance on the Pacific Coast in which a woman has been employed in this capacity.

Dallas Experimenting with Skip-Stops.—The City Commission of Dallas, Tex., has enacted an ordinance providing for experimental skip-stop operation on several lines of the Dallas Railway. The ordinance as enacted applies only to the downtown section and to the Ervay and South Belt lines.

Another Massachusetts Fare Request.—The Northampton (Mass.) Street Railway has petitioned the Public Service Commission for permission to increase its fares. The company has also asked for an extension of its charter privileges which will allow it to carry baggage, express matter and newspapers.

Cleveland's One-Cent Line Succumbs.—What is known as the pier loop line, connecting the Public Square and the East Ninth Street pier, Cleveland, operated by the Cleveland Railway at a fare of 1 cent, will hereafter charge the same rate as the other lines in the city. Increased operating costs have made this necessary.

Rebates Ordered in Fare Case.—The Public Service Commission of Pennsylvania has ordered the Shamokin & Mount Carmel Transit Company, Mount Carmel, Pa., to comply with a recent ruling of the commission and issue certificates of excess fare to patrons, pending a decision on the litigation against the 6-cent fare.

Fare Charges Suspended.—The Public Service Commission of Massachusetts has further suspended operation of schedule 75, the original interurban "copper-zone" schedule, on the Bay State Street Railway until June 1, 1918, also workmen's commutation and excursion tickets until the same date. Decision of the commission regarding these tickets has been pending since Aug. 10, 1917.

Manchester Would Charge Six Cents.—In order to maintain the road in reasonable condition, and enable it to earn such a dividend as it has paid in the past, application has been made to the Public Service Commission of New Hampshire by the Manchester Street Railway for its approval of an increase in fares from 5 cents to 6 cents as being the best and fairest arrangement for all concerned.

Pay-As-You-Enter Service in Minneapolis.—The Twin City Rapid Transit Company, Minneapolis, Minn., has the pay-as-you-enter plan on trial on the Fourth Avenue N and Sixth Avenue S line. This was the first line on which an electric car was operated in Minneapolis. The change in power was made on Dec. 24, 1889. The present trial provides for entrance and exit at the conductor's end.

New Jersey Hearing Postponed.—The Board of Public Utility Commissioners of New Jersey has postponed until May 8 the hearing on the application of the Public Service Railway for increased rates. The adjournment was granted on request of Marshall Van Winkle of counsel for the municipalities which are opposing the proposed increases. He desired additional time for himself and his associates in which to prepare his side of the case.

Staggered Hours at Camden.—In an effort to relieve rush-hour congestion on the lines of the Public Service Railway at Camden, N. J., and New York Shipbuilding, New Jersey Shipbuilding and Pennsylvania Shipbuilding companies have put into effect new schedules of working hours, so that the thousands of workers will not conflict with each other in going and coming to the various plants.

Atlanta Fare Case Set for May 26.—The petition of the Georgia Railway & Power Company, Atlanta, for permission

to increase fares to 6 cents and to charge 2 cents for a tranfer will be heard before the Railroad Commission of Georgia on May 21. The increase in fares would apply to all lines in Atlanta, except the Atlanta-Stone Mountain route, and also to the company's system in Gainesville.

City Acts Against Company.— R. S. Houch, city solicitor of Scranton, Pa., has filed a bill in equity asking the court to rescind, cancel and annul all contracts now existing between the city and the Scranton Railway. The bill attacks the company's right to continue to operate on the ground of general violations of franchise agreements. The suit is the outcome of the company proceeding with its plan to put 6-cent fares into effect despite protests from the city.

Hearing on New Albany Application.—The hearing on the application of the Louisville & Southern Indiana Traction Company to the Public Service Commission of Indiana for permission to increase its fares in New Albany and Jeffersonville and on the interurban line between New Albany and Jeffersonville was held in New Albany on April 16. The commission took the case under advisement after hearing testimony on both sides in regard to the value of the property.

Lynchburg Fare Petition Heard.— The petition of the Lynchburg Traction & Light Company, Lynchburg, Va., to be allowed to discontinue the sale of six tickets for 25 cents was heard before the State Corporation Commission recently. Representatives of both the city and the company admitted that the commission had jurisdiction in the matter in spite of the fact that the company was operating under a city franchise. Further evidence is to be submitted later.

Appeal from Two-Man Crew Law.— Stockholders of the Fort Smith Light & Traction Company, Fort Smith, Ark., have brought suit in the United States District Court for an injunction against prosecutor Earl U. Hardin and Attorney John D. Arbuckle restraining them from prosecuting the company for failure to observe an act passed in 1915 by the Legislature providing for two-men crews on all electric cars in Sebastian County. The court is asked to declare the act unconstitutional.

No Return to Railway-Jitney Competition.—The City Commissioners of Atlantic City, N. J., have killed a bill, providing for the return of jitneys to Atlantic Avenue, where the Atlantic City & Shore Railroad has enjoyed a transportation monopoly since the jitneys were driven from that thoroughfare a year ago. Those who urged the return of the jitneys to Atlantic Avenue contended that the railway had not complied with promises made in its behalf when the measure was adopted ruling the autos off that thoroughfare.

Straight Fare Proposed.—The Chicago, Ottawa & Peoria Railway, a subsidiary of the Illinois Traction System, has applied to the Public Utilities Commission of Illinois for permission to abolish zone fares and to establish a straight 2-cent fare. The company also desires to collect 3 cents a mile from all passengers who board cars without tickets and to eliminate the sale of round-trip tickets. The commission early in the year approved similar tariff changes for other Illinois Traction System interurban properties. They were noted in the ELECTRIC RAILWAY JOURNAL for Feb. 9, page 297.

Taken Without a Chaser.—Kirk Miller said recently in the Washington *Post:* "Look at this skip-stop system, which we never thought we could take without a chaser. At first everybody made a sour face when they swallowed a dose of skip-stop and it was unanimously voted that we should declare war on Turkey, Bulgaria and Skipstopia and issue passports to Dr. Beeler and his entire retinue. Now we're ready to elect him first lord mayor of the Skipstopovian islands, and donate him a complete set of flat wheels as medals for his intricate surgical operations in the vicinity of our bad tempers."

Would Abandon Flat for Zone Fares.—The Milford, Attleboro & Woonsocket Street Railway, Milford Mass., operating 28 miles of electric railway, has asked the Public Service Commission for permission to change to a zone fare basis. This would eliminate the present fare section of 5 cents and substitute a minimum fare of 5 cents for two of the proposed zones and 3 cents cash for each additional zone traveled, or 2½ cents for the extra zone when tickets are purchased. The company planned to put the new system into effect on April 15, but the commission suspended the tariff until June 1.

Commission Opposed to Turnstiles.— The Public Service Commission for the First District of New York, approving an opinion by Commissioner Charles Bulkley Hubbell, has put itself on record as against the general adoption of turnstiles, or passimeters as they are sometimes called, in connection with ticket booths, especially in Manhattan, and the commission has denied an application of the New York Municipal Railway Corporation (Brooklyn Rapid Transit System) for the installation of turnstiles in the Rector Street, Cortlandt Street and City Hall stations on the Broadway subway.

Segregating the Wets.—To meet a problem which arises every Saturday night in handling traffic between Pawtucket, wet, and Attleboro, dry, the Interstate Consolidated Street Railway is trying to work out a system of segregating its passengers. On the last trip on Saturday nights two cars leave Pawtucket together. The scheme adopted by the management of the railway is to have the conductors usher into one car, as far as practicable, those who are under the influence of liquor, so that they may keep to themselves and leave the other car for persons who are sober and well-mannered.

Court Sustains Cleveland Fare Change.—On April 23 the Supreme Court of Ohio, announced its refusal to review the decision of the Court of Appeals of Cuyahoga County in the case of the city of Cleveland against the Cleveland Railway wherein was questioned the right of the company to increase its rate of fare under the Tayler franchise from schedule C to schedule B. The Common Pleas Court recently granted an injunction, preventing the company from taking this step, but the restraining order was promptly dismissed by the Court of Appeals. Since the case was filed the rate has been advanced to Schedule A.

Railway to Operate Buses.—The New Jersey Transportation Company, a subsidiary of the Public Service Corporation of New Jersey, Newark, N. J., has made application to the director of improvements for the necessary permits to operate eighteen motor buses from Hamburg Place and Gotthart Street to the shipbuilding plants at Port Newark Terminal. It is planned to have the buses connect with cars of the Public Service Railway on the South Orange line terminating at Hamburg Place, the fare to be 5 cents on the electric railway and 5 cents on the bus. The buses will be operated from 6 a. m. to midnight.

Lincoln Fare Hearing Closed.—On April 23 the State Railway Commission of Nebraska overruled the motion of the city of Lincoln to take an inventory of the property of the Lincoln Traction Company in connection with the pending fare case and also overruled a motion of the city for a continuance of sixty days, which time was asked for by the city for the purpose of introducing testimony. The case was then submitted to the commission on the record. The company has two applications for leave to issue stock and bonds before the commission, and also an application alleging the present rates of fares are inadequate and requesting the commission to fix reasonable rates. An emergency petition of the company for fare relief was denied by the commission as noted in the ELECTRIC RAILWAY JOURNAL for March 2, page 435.

New Minneapolis Jitney Regulation.—Effective on May 6 Minneapolis will have a new jitney ordinance, some of the provisions of which are as follows: All such vehicles must be licensed. Drivers must be at least twenty-one years old and have a State chauffeur license. The owner must have a $10,000 surety bond or an insurance policy or a reciprocal or inter-insurance contract. The license fee is fixed at $25 for a vehicle with capacity of not more than seven, and $2 additional for each additional seat. Fares must be collected only when the vehicle is at a stop. Signs must indicate the route of each car. Between 5 a. m. and midnight the fare must not exceed 5 cents for each person for the full route, and at other times not more than 10 cents. Special trips may be made without regular route signs at special compensation.

Personal Mention

R. Home Smith, Toronto, Ont., has been elected president and director of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., to succeed William O. Morgan, New York, resigned.

George D. Powell has been promoted to the position of office engineer in the maintenance of way department of the Union Traction Company of Indiana, Indianapolis, Ind. He was formerly draftsman in that department.

C. S. MacCalla has resigned as vice-president and general manager of the Washington Water Power Company, Spokane, Wash., and left on April 25 for New York City, although he had intended to remain in Spokane until May. A farewell dinner to him at the



C. S. MACCALLA

Spokane Club was attended by officers and employees of the company. Mr. MacCalla was graduated from the electrical engineering school at Lehigh University in 1896. He had been with the Washington Water Power Company for sixteen years. Previous to that he was with an Australian railway for the General Electric Company and later with the Brooklyn (N. Y.) Edison Company. He went to Spokane as assistant to the general manager. At that time that official was D. L. Huntington, now president of the company. Mr. MacCalla was later promoted to general manager and then to vice-president and general manager. He had the executive direction of the installation of four large auxiliary power plants now operated by the company. The first of these was at Post Falls, Idaho, on the Spokane River, erected in 1904 and 1905; the steam plant at Ross-Park, in Spokane, in 1907 and 1908; the 27,000-hp. plant at Little Falls, Spokane River, in 1908 to 1910, and the Long Lake plant, Spokane River, which was under construction from 1911 to 1913. The last-mentioned plant has a capacity of 67,000-hp. and provides for an ultimate capacity of 90,000-hp.

G. O. House has been appointed superintendent of the St. Paul lines of the Twin City Rapid Transit Company, succeeding A. L. Cunningham, who has been appointed captain in the National Army, Quartermaster Corps. Mr. House has been superintendent of the St. Paul Water Works.

John H. Roemer, of the legal firm of Cummins, Roemer, Flynn, Milkewitch & McKenna, counsel for H. M. Byllesby & Company, Chicago, has been obliged to decline a commission as lieutenant-colonel in the National Army, to act on a board of appraisers on account of his present engagement for the government as a civilian in connection with various boards of appraisers engaged in similar work concerned with terminal and dockage property under consideration for use by the Government in its war activities.

William T. Price has been appointed traffic manager and property agent of the Denver (Col.) Tramway and the Denver & Intermountain Railroad. Mr. Price entered railroading in 1902 as a clerk in the Omaha offices of the Chicago, St. Paul, Minneapolis & Omaha Railroad. In 1904 he went to the Union Pacific as clerk in the freight claim department at Omaha, advancing to the position of traveling freight claim agent and adjuster. In 1911 he was transferred to Denver, where he held the position of contracting freight agent until 1912, when he was appointed traveling freight agent for Colorado territory. On Aug. 1, 1915, he was made commercial agent of the Union Pacific System in charge of southern Colorado, which he handled from Pueblo. He resigned from the Union Pacific System on April 1 to become connected with the Denver Tramway.

Townsend H. Soren has been elected a vice-president of the Hartford (Conn.) Electric Light Company in charge of construction. Immediately after graduation from Harvard he was employed by the General Electric Company at Schenectady and remained with that company until July, 1916. Mr. Soren's duties with the General Electric Company were largely confined to the general supervision of the work of that company in connection with large electric railway developments in New York City. This work started with the equipment of the Ninety-sixth Street power station and substations of the Metropolitan Street Railway in 1897 and was followed by the equipment of the Manhattan Elevated Railway, the Interborough Rapid Transit Company and the Hudson & Manhattan Railroad and the electrification of the main line of the New York Central & Hudson River Railway, including the construction and electric equipment of the locomotives for that company.

J. W. Brown has resigned as assistant general superintendent of the Public Service Railway, Newark, N. J., to become general manager of the Wheeling (W. Va.) Traction Company, taking over with that company, among other duties, those previously performed by W. B. Atwood, general superintendent, who resigned to accept a position elsewhere. Mr. Brown has been connected with the Public Service Railway since April, 1911. He has been assistant general superintendent since 1913. Previous to 1911 he was with the Aurora, Elgin & Chicago Railroad, and prior to that time was superintendent of transportation of the West Penn Railways, Connellsville, Pa. He entered the service of the McKeesport, Wilmerding & Duquesne Railway, McKeesport, Pa., about fifteen years ago as night car dispatcher. He also served as electrician and later as power station engineer of this company. When the Pittsburgh, McKeesport & Connellsville Railway was formed Mr. Brown was



J. W. BROWN

made master mechanic of the McKeesport Division of that road and later was promoted to division superintendent. When the transportation department of the company was organized in 1903 he was appointed superintendent of transportation of the company. He resigned from the West Penn Railways in August, 1910, to become connected with the Aurora, Elgin & Chicago Railroad. Mr. Brown has built up for himself an enviable reputation in the handling of men and in solving problems in connection with the new science of employment. He has been editor of the employees' publication of the Public Service Railway, the *Trolley Weal*, since its establishment in 1917. Mr. Brown has been very active in the work of the American Electric Railway Transportation & Traffic Association, particularly as vice-chairman of the joint committee on block signals for electric railways. His associates in the Public Service Railway tendered a banquet to him on April 10. Among those who attended were R. E. Danforth, J. L. O'Toole, H. V. Drown, M. R. Boylan, A. Jackson, H. C. Donecker, N. W. Bolen, M. Schreiber, W. B. Graham and H. A. Benedict.

Construction News

Recent Incorporations

*Chillicothe & Camp Sherman Electric Railway, Chillicothe, Ohio.—Incorporated with a capital stock of $50,000. Incorporators: George A. Vaughters, president of the Chillicothe Electric Railroad, Light & Power Company, John A. Poland, J. A. Phillips, Alex Renick, J C. Martin and Ralph Madison.

Franchises

San Francisco, Cal.—The United Railroads of San Francisco has received a franchise to construct an extension of its Army Street line to the Union Iron Works.

Chicago, Ill.—Following its custom of not permitting building operations which are not necessary to the success of the war, the Illinois Public Utilities Commission has denied a certificate of convenience and necessity to the Chicago, Fox Lake & Northern Traction Company, which proposed to build an interurban line from Palatine, Ill., north into Wisconsin. The new company also proposed to purchase the property of the Waukegan, Rockford & Elgin Traction Company, which the commission would not allow. [May 26, '17.]

Philadelphia, Pa.—The West Philadelphia Passenger Railway, a subsidiary of the Philadelphia Rapid Transit Company, has received a franchise from the City Council to construct a new double-track extension on Island Road and Eastwick Avenue to the county line.

Track and Roadway

Los Angeles (Cal.) Railway.—In view of the emergency now existing and the impossibility of procuring grooved girder rails from the mills, the Los Angeles Railway Corporation and the Pacific Electric Railway have petitioned the City Council of Los Angeles to amend the ordinance of the city prescribing the type of railroad construction and railroad rails in streets so as to permit railroad construction of a type other than with grooved girder rail and concrete base outside of the business district of the city.

Jacksonville, (Fla.) Traction Company.—Operation has been begun by the Jacksonville Traction Company on its line to Camp Johnston.

Des Moines (Ia.) City Railway.—The Des Moines City Railway has begun its season's construction work in Des Moines. The first work is at Seventh and Walnut Streets, in the heart of the business district, where special construction is being placed. As soon as this is done the Fort Des Moines and Sevastapol lines will be routed through the loop. Heretofore these lines have terminated at Seventh and Grand Avenues and it has been necessary to switch the cars.

Manhattan City & Interurban Railway, Manhattan, Kan.—Announcement has been made by the Manhattan City & Interurban Railway that it will rehabilitate its track and overhaul all its equipment.

Shreveport (La.) Railways.—It is reported that plans are being considered by the Shreveport Railways for the construction of an extension of its East End line from Fourteenth Street to the eastern city limits.

Mattawamkeag & Northern Railway, Bangor, Me.—The Public Utilities Commission of Maine has granted an extension of the charter of the Mattawamkeag & Northern Railway, which proposes to construct a line from Mattawamkeag to Millinocket and East Millinocket, 23 miles. George W. Stearns, Millinocket, is interested. [April 13, '18.]

Butte (Mont.) Electric Railway: It has been announced the Butte Electric Railway will expend $70,000 in street and track improvements within the next few weeks. This sum will be distributed in the following projects: Broadway, from Montana to Arizona Street; West Granite, from Montana to Main Street; East Park, from Main to Covert Street and several blocks on Main Street. In addition, new switches and new material will be installed. Main Street will be double-tracked for several blocks.

International Railway, Buffalo, N. Y.—It is reported that the fast line of the International Railway from Buffalo to Niagara Falls will be opened on May 30.

Harrisburg (Pa.) Railways.—This company is reconstructing its double track in Second Street from Walnut to State Street and is constructing new track connecting the Cameron and Market Street lines.

Pittsburgh (Pa.) Railways.—The Public Service Commission of Pennsylvania has ordered the Pittsburgh Railways to construct a double or single track with turnouts in Wheatland Street, Pittsburgh. The order came as a result of a complaint by the city of Pittsburgh that the company had not constructed a line as required.

Dallas (Tex.) Southwestern Traction Company.—Work is being delayed on the construction of the proposed line of the Dallas Southwestern Traction Company from Dallas to Irving owing to trouble in getting the right-of-way. About four-fifths of the route has been graded. E. P. Turner, president. [March 9, '18.]

Dallas (Tex.) Railway.—No street car line will be built by the Dallas Railway from Dallas to Love Aviation Field, according to an announcement by Richard Meriwether, superintendent of the company. Mr. Meriwether said material is too high and too scarce and the labor supply is too uncertain to justify the undertaking.

Salt Lake, Garfield & Western Railway, Salt Lake City, Utah.—It is reported that electrification of the Salt Lake, Garfield & Western Railway to Saltair is practically completed and that electric cars will be operated on the line by May 30.

Texas Electric Railways, Dallas, Tex.—The tracks on Tarlton Avenue, Rose Hill, will be lowered to a level with the street by the Texas Electric Railway.

Shops and Buildings

Philadelphia (Pa.) Railways.—A contract has been awarded by the Philadelphia Railways to William Steele & Sons for the construction of a new car-house and repair shop at Penrose Ferry and Fort Mifflin Roads, to cost about $28,000.

Power Houses and Substations

Trenton & Mercer Traction Corporation, Trenton, N. J.—Major Edmund J. Barry, who is in charge of the government munitions plant at Tullytown, Pa., has ordered additional electric power furnished to the Trenton, Bristol & Philadelphia Street Railway from the power house of the Trenton & Mercer County Traction Corporation at Trenton, N. J. Wires will be strung through the streets of Trenton across the Delaware River to connect with the former line at Morrisville, Pa. The work of construction will begin in a short time. Major Barry was prompted to take this action because of the insufficient transportation accommodations placed at the disposal of the workmen from Trenton who are employed at the Merchant's Shipbuilding plant at Bristol, Pa., and the Foundation Munitions plant at Tullytown, Pa. The Trenton, Bristol & Philadelphia Street Railway Company informed the government authorities that it did not have sufficient power at its disposal to warrant the increased service desired.

Virginia Railway & Power Company, Richmond, Va.—A contract has been awarded by the Virginia Railway & Power Company to Nicholas & Linderman, Norfolk, for alterations and improvements in its one-story substation, to cost $11,700.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Review of the Coal Situation

National Association Predicts Shortage Unless Action Is Taken To Supply Necessary Transportation

According to a statement issued by the National Coal Association on April 28, another coal shortage, more serious than that of last winter, and almost certain interference with the war program, is inevitable throughout the East unless there is soon a readjustment of traffic over Eastern railroads. The enormous demands of other war industries are crowding coal off the rails, and the resultant continued shortage of cars at the mines has cut production to the danger point. This is the season of the year when the mines should be working at top speed to produce stocks for storage against the needs of next fall and winter. The mines, however, are not working at top speed, nor at a rate even approaching top speed. In the face of the heaviest demand for coal in the country's history, the mines have been so hindered by insufficient car supply that they have made little, if any, headway over last year's record—a record which fell 50,000,000 tons short of meeting the nation's demands.

Opinions of operators in the great producing area east of the Mississippi, which furnishes more than 90 per cent of the country's bituminous coal, requested by the National Coal Association, are almost unanimously to the effect that the coal shortage next winter will be worse than that of last winter unless the mines are furnished sufficient cars to enable them to increase materially their present rate of production.

It is understood that the railroads are hauling far more traffic as a whole than they ever hauled before. It is evident therefore that freight of other classes than coal is responsible for all or practically all of this increase. It would seem that the time has come for the War Industries Board, or whoever is running the war, to decide upon a readjustment of traffic over the Eastern railroads so that coal may be handled in sufficient tonnage to take care of the industrial and domestic requirement of the Eastern States.

The latest official summary of the United States Geological Survey shows that with a full-time output of 15,500,000 tons, bituminous mines produced during the week ending April 13 but 70.1 per cent of output or 10,864,000 tons. Production lost because of car shortage was approximately 2,800,000 tons during the week or 467,000 tons a day.

Pennsylvania fields capable of producing 4,385,000 tons during the week lost 762,000 tons, or 17 per cent because of car shortage. The following table, covering fifteen producing sections with a full-time output of 11,810,000 tons during the week, shows the extent to which production was curtailed by inadequate transportation facilities in each field:

Producing Field	Full-Time Output, Tons	Production Lost Because of Car Shortage—Tons
Western Pennsylvania	2,000,000	460,000
Central Pennsylvania	2,000,000	150,000
Somerset County, Pa.	185,000	105,000
Irwin Gas Fields, Pa.	200,000	47,000
Illinois	2,450,000	352,000
Indiana	945,000	192,000
Southern Ohio fields	480,000	130,000
Northern and Central Ohio fields	760,000	240,000
New River and Winding Gulf Fields, West Virginia	430,000	93,000
Fairmont Fields, West Virginia	260,000	145,000
Cumberland and Piedmont fields, West Virginia and Maryland	200,000	55,000
High volatile fields of southwest Virginia	835,000	255,000
Northeastern Kentucky fields	230,000	55,000
Western Kentucky fields	355,000	73,000
Southern Appalachian fields	480,000	40,000
Total	11,810,000	2,392,000

Rotary Market Dull

War Situation Is Determining Practically the Entire Demand—Delivery Conditions Unimproved

As with other railway equipment rotary converter demand is very light. Such business as is heard of pertains directly or indirectly to government requirements. Where extensions have been made by the traction roads it is of the same character; that is, to meet the transportation demands at cantonments and camps or other military and naval needs. Prices have remained about stationary for some time, and no changes are anticipated. It is more difficult to obtain material—iron, steel, copper, etc. This is particularly true of steel for the shaft.

Another angle to the situation is that often when commercial orders are made up a government representative comes along and finds the rotary will satisfy the requirements of some government installation, whereupon it is commandeered without ceremony. Of rotaries on order at the present time about 88 per cent are for the government on priority. Even with a certificate of priority a rotary of 2000-kva. rating is not deliverable under six months. On a commercial requirement it is eight months, with from seven to eight months on 500-kva. units.

Filling Steel Orders on Private Account Held Up

Facilities of Mills and Blast Furnaces Devoted Solely to Government Requirements for Thirty Days.

At a meeting of fifty iron and steel manufacturers held in New York City April 26, after a conference with government officials, it was decided to hold in abeyance practically all orders for commercial steel. By this action the heads of the industry engaged to put their entire plants at the disposal of the United States and the allied governments for the production of material for the munition factories and shipyards, thereby sidetracking indefinitely contracts entered into with private buyers. Therefore manufacturers of rolling stock, railway equipment, electrical apparatus, machinery, supplies, accessories and a long line of specialties and staples for which steel is essential, unless requirements have been anticipated and sufficient stocks are on hand to meet the demand, will be obliged to curtail or defer production and postpone promised deliveries.

Exceptions from this program, it is understood, will be only those buyers of commercial steel who secure government authorization for the early completion of their orders. The initial steps in this schedule for concentration were taken several weeks ago, when a number of companies decided to shelve for a period of thirty days all commercial orders.

Furthermore, a fresh survey of steel consumption throughout the country made by the government requires that each seller of steel be informed by his customer or the buyer the precise use to which steel already ordered is to be put. All tonnage either on government or civilian orders is to be so itemized. The various rulings that have been made as to priorities in manufacture and shipment are to be elaborated, so that in substance there will be a definite sequence all along the line, the less essential commodities to be placed nearer the bottom of the list.

Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C., in a recent report describes the strained tariff relations that existed between Russia and Germany much of the time between 1890 and the outbreak of the war. Copies can be obtained at the price of 5 cents from the superintendent of documents, Government Printing Office, Washington, D. C.

Open-Car Equipment Receiving Slight Attention

Railways Not Buying Material or Supplies as in Former Years—Standard Closed Type Preferred

Contrary to the practice of former years a number of the Eastern electric railway companies are not making their usual preparations for the refurnishing and rehabilitation of their open rolling stock. Manufacturers and agencies which specialize in this equipment frankly say the buying for this purpose, which customarily is in evidence long before this, has not materialized. A majority of the traction roads purchase their essential supplies and requisites in the winter. One of the largest Eastern corporations, when questioned, stated it had not made up any summer budget this year and that this matter was always arranged in the winter.

In explanation of this attitude the vice-president and general manager said he had discussed this matter with the officials of other railways and the consensus of opinion was that no extensive repairs, replacements or refurnishing of open cars, other than was absolutely necessary, would be made.

One reason was that the income of many traction roads was insufficient to met the expense. A second was that even if the funds were available it would be undesirable, on patriotic grounds, so to spend them. All the money that could be spared, the official continued, should be invested in Liberty Bonds to help win the war, and non-essential betterments could wait.

For seatings it was learned that no orders were given, the informant, who has wide experience, remarking that the electric railways were getting away from the regulation open cars. The closed type, with facilities for removing or dropping the windows and depending on the heavy curtains for storm protection, was preferred and being placed in service. Of curtains of duck—striped, plain or colored—very little had been bought for summer equipment. At one time this was an item of importance, but this year, to quote a manufacturer who furnishes curtains for a large portion of the new rolling stock, only one road, a system operating at a seaside resort, had purchased a yard, and the order was for only five cars.

Duck, he said, was scarce—in fact none was to be had, as the government had commandeered the entire available supply. The price had been going up steadily, 75 per cent representing a year's increase. As previously noted in the ELECTRIC RAILWAY JOURNAL curtain fixtures, which are about all patented articles, have advanced 10 per cent in six months on the light-weight kind. So far as could be ascertained, companies which do no overhauling until the cars are actually brought out of the carhouses for summer service were also dilatory in providing equipment of this description.

Gear Manufacturers Hold Convention and Elect Officers

The second annual meeting of the American Gear Manufacturers' Association was held at White Sulphur Springs, W. Va., April 18 to 20, 1918.

At the opening session F. N. Sheppard, of the United States Chamber of Commerce, spoke on "How We Can Get Behind the Government and Help Win the War," and B. F. Waterman presented a paper on "Gear Standardization."

At the morning session on Friday an executive committee and officers for the ensuing year were elected as follows:

Executive committee: F. W. Sinram, Frank D. Hamlin, H. E. Eberhardt, Frank Burgess, George L. Markland, Jr., Milton Rupert, William Ganschow, E. J. Frost and H. W. Chopin.

The officers elected were president, F. W. Sinram; vice-president, H. E. Eberhardt; secretary and treasurer, Frank D. Hamlin.

At the Saturday session the papers presented were: "Uniform Cost Accounting," by J. H. Dunn, and "Hobbs and Hobbing Machines," by F. G. Hoffman and John Edgar.

Railroad Administration Orders 30,000 Cars

An Additional Lot of 70,000 Also Being Under Negotiation—Completion To Be Rushed

Orders for 30,000 box and coal hopper cars, involving between $80,000,000 and $90,000,000, has been placed by the Railroad Administration with the American Car & Foundry Company. This is the first order of its kind entered into on so large a scale since the government asumed control of the railroads. It is expected the cars will be completed in time for the fall and winter business of the roads. Reports also say negotiations are pending for the construction of 70,000 additional freight cars.

The cars will have steel underframes and a sufficient quantity of the materials has been assured by the War Industries Board. The contract was awarded on the basis of an approximate profit of 5 per cent on the manufacturer's cost. The impression in metal circles is that the plans will involve the use of a minimum amount of wood in the box cars and probably some wood in the superstructure of the hopper cars.

Rolling Stock

Washington Railway & Electric Company, Washington, D. C., which recently ordered twenty-five new cars, as noted in the ELECTRIC RAILWAY JOURNAL of Apr. 3. from the G. C. Kuhlman Car Co., this week added another twenty-five, making fifty in all. The specifications duplicate those published in this department on April 20, page 794. Delivery of the new lot will be in October.

Public Service Railway, Newark, N. J., to equip the shipyards branch of its system in Camden and Gloucester, N. J., last week ordered thirty-three new cars, standard type, of the Cincinnati Car Company, referred to in recent numbers of the ELECTRIC RAILWAY JOURNAL. The rolling stock and other necessary improvements on order of the United States Shipping Board, Emergency Fleet Corporation, will cost about $1,250,000, and go through on priority preference. Delivery of the cars is to be made in ninety days.

Brooklyn (N. Y.) Rapid Transit Company now states that it is probable no order for the fifty new centre-entrance trail cars, for which specifications are in hand, will be placed within a month. The matter is now in the personal charge of T. S. Williams, president of the company.

Hudson & Manhattan Railroad, New York, N. Y., which submitted estimates and specifications to the United States Shipping Board Emergency Fleet Corporation for an extension to the shipyards at Port Newark Terminal, N. J., and for the purchase of 100 all-steel cars as mentioned in the ELECTRIC RAILWAY JOURNAL, March 23, page 597, and subsequently, has its proposition still under consideration. Reports say Engineer Drum recommended the improvement, but Admiral Bowles is opposed to the plan on account of the cost, which is placed at $3,000,000.

Interborough Rapid Transit Company, New York, N. Y., which has been in the market for 10,000 tons of heavy steel rails for its 1919 requirements, has not yet succeeded in placing the order. The steel mills decline to accept its terms, both on price and delivery.

Philadelphia (Pa.) Rapid Transit Company, following the order for 100 new cars, on account of the United States Shipping Board, Emergency Fleet Corporation, for the Hog Island shipyard extension referred to and of which specifications were published in the ELECTRIC RAILWAY JOURNAL, March 16, page 552, is reported as about to purchase fifty additional cars of the same type, to be operated in the same service.

Manila Railroad & Light Corporation, Manila, P. I., controlled by the J. G. White Management Corporation, New York, N. Y., which has been contemplating the purchase of fifteen new cars, as mentioned in the ELECTRIC RAILWAY JOURNAL of Jan. 26 and Feb. 23, is now preparing the specifications in which bids will be asked. The order will be placed shortly, as it will take nearly a year and a half after the car builders have them on delivery before they will reach Manila. The rolling stock is to be two-man single and double truck, and it is reported the St. Louis Car Co., which built the last cars for the Manila corporation, will receive the order.

Trade Notes

Sprague Electric Works of the General Electric Works, New York, N. Y., announces the removal of its office in Boston from 201 Devonshire Street to 84 State Street, room 906; also the removal of its quarters in St. Louis, from the Chemical Building to the Pierce Building, room 1352.

Drew Electric & Manufacturing Company, Indianapolis, Ind., manufacturer of electric railway, light, power and gas materials, has appointed William M. Lawyer its sales representative for the northern part of the State of New York. Mr. Lawyer has headquarters at 383 West Fayette Street, Syracuse, N. Y.

National Bank of Commerce, New York, N. Y., has printed the Export Trade Associations act (Webb act), as approved April 11, with annotations in convenient pamphlet form. The enactment of the law is a decisive step, in the direction of an expansion of foreign trade. Copies may be had by applying to the foreign department of the bank.

Fred W. Godfrey has severed his connection with the Republic Electric Company to become associated with the American Carbon & Battery Works of the National Carbon Company, Inc., of East St. Louis, Ill. Mr. Godfrey will cover all of Minnesota, North and South Dakota, Nebraska, Colorado, Montana, Wyoming, Utah, Idaho and New Mexico. He has traveled the Central West for many years.

Jeffery-DeWitt Company, manufacturer of high-tension disk insulators, will after June 1 move its factory from Detroit, Mich., to Kenopa, W. Va.

Charles C. Shneider, manufacturers' agent, has moved from 329 to 327 Broadway, Market Building, Detroit, Mich., where larger quarters have been secured. Mr. Schneider, who represents the Pittsburgh Lamp, Brass & Glass Company, has recently added to his line the transformers made by the Cumberland Electric Company of Memphis, Tenn.

Aspromet Company, Pittsburgh, Pa., will, after May 1, be the new name of the Asbestos Protected Metal Company. When this company was established in 1905, its sole product was asbestos protected metal. It has now a line of building material specialties, many of which contain neither asbestos nor metal in their make-up. The former name became restrictive to the point of being misleading; hence the change.

General Electric Company, Schenectady, N. Y., had one of the most novel exhibits at the annual meeting of the Natinal Railway Appliance Association in Chicago, Ill., in March, in the form of its large service flag. Due to war conditions, making shipments for exhibits all but impossible, the General Electric Company was unable to install its usual representative exhibit for this occasion. The best answer to this question of why the company's railway appliances were not on exhibit was the service flag, showing 3650 employees in the army and navy service, flying from a flagstaff in the space reserved.

New Advertising Literature

Economy Electric Devices Company, Chicago, Ill.: Bulletin 50, illustrated, entitled "The Economy Meter: An Electric Railway Efficiency Device," has interesting chapters on efficiency in electric railway operation, advantages of energy checking and other subjects of equal import.

Wilson Welder & Metals Company, Inc., New York, N. Y.: Illustrated catalog "Electric Welding Manual," furnishing instructions for the installation, care, operation and maintenance equipment of the Wilson system. It may be interesting to note that the damaged engines of the German interned ships, seized by the United States government, were repaired in part by the Wilson welding system, the details of which are given.

Westinghouse Traction Brake Company, Pittsburgh, Pa.: Illustrated catalog, publication No. 9035, entitled "Motor Driven Compressors: Westinghouse and National Types." Primarily these air compressors were designed for use in connection with air-brake equipment on electric cars, a service requiring an unusual degree of efficiency, reliability, compactness, ease of access and quiet operation. These characteristics also make them particularly suitable for general commercial purposes; and they are finding a wide field of application wherever electric motive power is available. The various types are described in detail.

NEW YORK METAL MARKET PRICES

	April 24	May 1
Copper, ingots, cents per lb.	23½	23½
Copper wire base, cents per lb.	26½ to 26½	26½ to 26½
Lead, cents per lb.	6.90	7.00
Nickel, cents per lb.	50	50
Spelter, cents per lb.	6.87½	7½
Tin, Straits, cents per lb.	92	96
Aluminum, 98 to 99 per cent., cents per lb.	†32.10	†32.10

* No Straits offering. † Government price in 50-ton lots, f.o.b. plant.

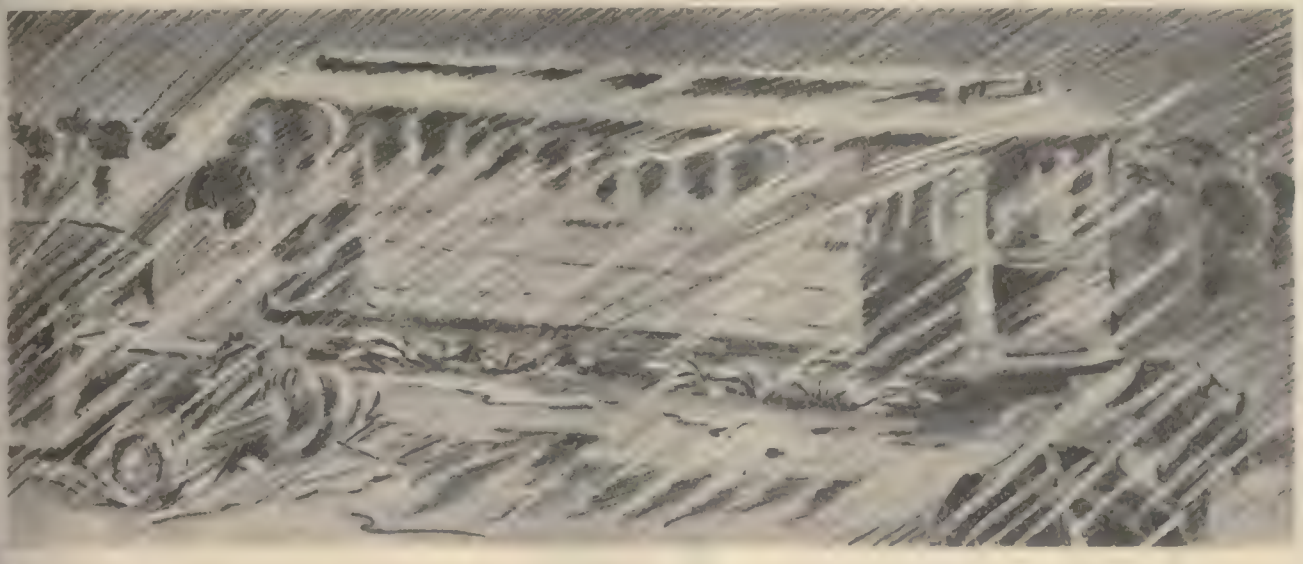
OLD METAL PRICES—NEW YORK

	April 24	May 1
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19½	19½
Red brass, cents per lb.	18	18
Yellow brass, cents per lb.	13	13
Lead, heavy, cents per lb.	6	6
Zinc, cents per lb.	5½	5½
Steel car axles, Chicago, per net ton.	$41.52	$41.52
Old carwheels, Chicago, per gross ton.	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton.	*$34.00	*$34.00
Steel rails (relaying), Chicago, gross ton.	$60.00	$60.00
Machine shop turnings, Chicago, net ton.	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	April 24	May 1
Rubber-covered wire base, New York, cents per lb.	27 to 30	27 to 30
Weatherproof wire (100 lb. lots), cents per lb., New York	28½ to 34½	30.40 to 34½
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.25
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 500-ton lots, per gross ton	.....	$65.00
T-rails, high (Shanghai), cents per lb.	4½	4½
Rails, girder (grooved), cents per lb.	4½	4½
Wire nails, Pittsburgh, cents per lb.	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb.	*3½	*3½
Tie plates (brace type), cents per lb.	*3½	*3½
Tie rods, Pittsburgh base, cents per lb.	7	7
Fish plates, cents per lb.	*3½	*3½
Angle plates, cents per lb	*3½	*3½
Angle bars, cents per lb	*3½	*3½
Rail bolts and nuts, Pittsburgh base, cents per lb.	4.90	4.90
Steel bars, Pittsburgh, cents per lb.	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb.	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb.	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb.	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount, F. O. B. factory	80% to 82-3%	80% to 82-3%
Car window glass (single strength, first three brackets, B quality), New York, discount, F. O. B. factory	79%	79%
Car window glass (double strength, all sizes AA quality), New York, discount, F. O. B. factory	80%	80%
Waste, wool (according to grade), cents per lb.	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	12½ to 13	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$40.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.50
Asphalt filler, per ton	$45.00	$45.00
Cement (carload lots), New York, per bbl.	$2.65	$2.65
Cement (carload lots), Chicago, per bbl.	$2.71	$2.71
Cement (carload lots), Seattle, per bbl.	$3.05	$3.05
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.60	$1.60
White lead (100 lb. keg), New York, cents per lb	10	10
Turpentine (bbl. lots), New York, cents per gal.	43½	43½

* Government price.



Peacock Brakes

Are for *Use* Whether You Have Air Brakes Or Not

No matter how good your air brakes are you must have a brake that will work absolutely if something goes wrong in the motorman's valve, cylinder, compressor or other parts of the air system.

That's why even if reserved only for emergency or contingency service, a brake must be so easy to operate and so graduated to the load that the motorman will have faith in it when it comes to a pinch.

As a matter of fact Peacock Brakes are so easy to use that operators of air-brake cars, like the Brooklyn Rapid Transit System, instruct the men to use their *Peacock Brake exclusively* over specified portions of their runs.

National Brake Co.
Buffalo, N. Y.



Bankers and Engineers

SANDERSON & PORTER
ENGINEERS
REPORTS • DESIGNS • CONSTRUCTION • MANAGEMENT
HYDRO-ELECTRIC DEVELOPMENTS
RAILWAY, LIGHT AND POWER PROPERTIES
CHICAGO NEW YORK SAN FRANCISCO

THE J. G. WHITE COMPANIES
ENGINEERS CONTRACTORS
FINANCIERS OPERATORS
43 EXCHANGE PLACE . . . . NEW YORK
LONDON CHICAGO

THE ARNOLD COMPANY
ENGINEERS—CONSTRUCTORS
ELECTRICAL—CIVIL—MECHANICAL
105 SOUTH LA SALLE STREET
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Ford, Bacon & Davis,
Engineers.
115 BROADWAY
New Orleans NEW YORK San Francisco

ALBERT S. RICHEY
ELECTRIC RAILWAY ENGINEER
WORCESTER POLYTECHNIC INSTITUTE
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Industrial Plants and Buildings, Steam Power Stations, Water Power Developments, Substations, Gas Plants, Transmission Lines, Electric and Steam Railroad Work.
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H. M. Byllesby & Company, Inc.
NEW YORK Trinity Bldg. CHICAGO No. 208 So. La Salle St. TACOMA Washington
Purchase, Finance, Construct and Operate Electric Light, Gas, Street Railway and Water Power Properties.
Examination and reports. Utility Securities Bought and Sold.

A. L. DRUM & COMPANY
CONSULTING AND CONSTRUCTING ENGINEERS
VALUATIONS AND FINANCIAL REPORTS
CONSTRUCTION AND MANAGEMENT
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General Superintendence and Management
Examinations and Reports
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Sloan, Huddle, Feustel & Freeman
Consulting Engineers
Analytical Studies of financial and operating conditions, appraisals and rate adjustments of electric railway and all public utility properties.
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ENGINEERS
MILWAUKEE First National Bank Bldg.
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JOHN A. BEELER
OPERATING AND RATE INVESTIGATIONS
TRAFFIC SURVEYS AND SCHEDULES
52 Vanderbilt Ave. NEW YORK
ELECTRIC RAILWAY MANAGEMENT
SUPERVISION OF CONSTRUCTION
ENGINEERING
APPRAISALS
343 District Bldg. Washington, D. C.

S. D. PUGH
CONSULTING ENGINEER and TRACTION EXPERT
Appraisals, Rate Investigations, Interurban and Street Railways, Traffic Surveys, Financial Reports
8 EAST LONG ST., COLUMBUS, OHIO

Scofield Engineering Co. Consulting Engineers
PHILADELPHIA, PA.
POWER STATIONS GAS WORKS
HYDRAULIC DEVELOPMENTS ELECTRIC RAILWAYS

ELECTRICAL TESTING LABORATORIES
Electrical, Photometrical and Mechanical Testing.
80th Street and East End Ave., New York, N. Y.

THE P. EDW. WISCH SERVICE
Suite 1710 Park Row Bldg., New York
DETECTIVES
Suite 715 Board of Trade Bldg., Boston

Frederick Sargent Wm. S. Monroe A. D. Lundy James Lyman
SARGENT & LUNDY, *Engineers*
1412 Edison Bldg., 72 W. Adams St., Chicago, Ill.

AMERICAN BRIDGE COMPANY

HUDSON TERMINAL-30 CHURCH STREET, NEW YORK

Manufacturers of Steel Structures of all classes particularly BRIDGES AND BUILDINGS



Transmission Towers at Birmingham, Alabama. Alabama Power Company.

SALES OFFICES

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Philadelphia, Pa. . Widener Building
Boston, Mass. . . John Hancock Bldg.
Baltimore, Md., Continental Trust Bldg.
PITTSBURGH, PA. . . Frick Building
Buffalo, N. Y. . Marine National Bank
Cincinnati, Ohio. Union Trust Building
Atlanta, Ga. . . . . Candler Building
Cleveland, Ohio . . Guardian Building
Detroit, Mich., Beecher Ave. & M. C. R. R.
CHICAGO, ILL., 208 South La Salle St.
St. Louis, Mo., Third Nat'l Bank Bldg.
Denver, Colo., First Nat'l Bank Building
Salt Lake City, Utah, Walker Bank Bldg.
Duluth, Minn. . . . . Wolvin Building
Minneapolis, Minn., 7th Ave & 2nd St. S. E.

Pacific Coast Representative:
U. S. Steel Products Co. Pacific Coast Dept.
SAN FRANCISCO, CAL., Rialto Building
Portland. Ore. . . . . Selling Building
Seattle, Wash., 4th Ave. So. Cor. Conn. St.

Export Representative:
United States Steel Products Co., 30 Church St., N. Y.

IF YOU WANT PROOFS

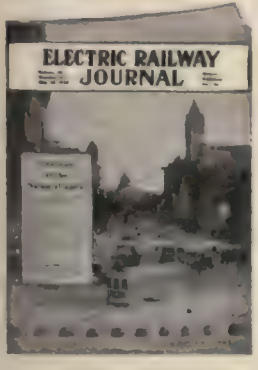
of your advertisements, and time to return them with corrections

Copy Must Be in Our Hands Two Weeks in Advance of Publication Date

Copy Changes. If no proofs are desired your advertisements should be in our hands Wednesday of the week preceding date of publication, otherwise your latest advertisement in accordance with schedule will be repeated.

New Advertisements (not changes of copy) can usually be accepted up to noon Wednesday of the week of publication, but no guarantee can be given as to location or proofs or indexing.

Searchlight Advertisements (Proposals, Wants, For Sale, etc.) received as late as 10 A. M. Wednesday will be published if there is space available in the pages that go to press last. The paper is dated and mailed Saturday.



THESE are not arbitrary rules. We do our best to give our advertisers what they want—work overtime if necessary—but each advertising form has to be on the press at a specified time. That is why we cannot guarantee proof or location unless we have copy on time. We want our advertising space to work at maximum efficiency for our advertisers.

The Paper is dated and mailed Saturday

Electric Railway Journal, 10th Ave. at 36th St., New York



An Ounce
of FACTS

Is better than all the Theories on Earth

Indianapolis
Joints and Welding Supplies



"Apex" Joint
for Guard and Girder Rail

are saving their owners as much as $100 a day for every day they are in use. One company in particular writes as follows:

"We feel that we could not be without the use of these machines and would like to recommend them to others who are combating high cost of materials against the 5c carfare. We feel that these machines paid for themselves in sixty (60) days' time, and have kept record of savings and would gladly submit this data to anyone who would feel that same would be of interest to them."

How about asking us for the name and address of this company? Then you'll have the *facts* at once, or you can get this advice for the asking from any user of Indianapolis Welders. There are one or more in your immediate vicinity.

Users of Indianapolis Patented Welders, Joints and Welding Supplies Fully Protected

Indianapolis Switch & Frog Company, Springfield, Ohio

THE OHMER SYSTEM



Under the Ohmer System, it is decidedly to the conductor's advantage to *collect* the fare, to collect the *right fare,* and to *register* the fare *correctly.* If for any reason the fare is not registered, the conductor is constrained to turn it in anyway, and you have *knowledge of the fact that it was not registered.*

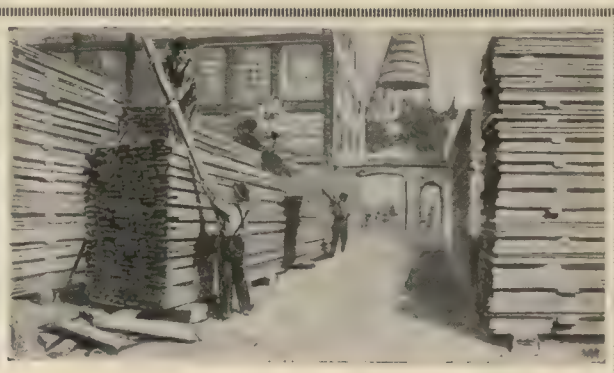
The publicity which surrounds each transaction is such that irregularities on the part of both passenger and conductor are reduced to a minimum. If there *are* any irregularities, they are soon understood through the method of merit analysis made possible by the Ohmer System and the proper discipline can be applied.

The Ohmer System consists of the most successful ideas of modern business applied to the conservation of the receipts of electric railways.

OHMER FARE REGISTER COMPANY

DAYTON, OHIO





Finished Products *versus* Raw Material

The economies that electric railway companies have been able to effect by the use of

Pantasote *and* Agasote

have been big and important.

Fundamentally these advantages have been possible because of the labor savings possible through the employment of a finished product ready to apply instead of a raw material such as wood in the shape of boards.

In the days when there was nothing better known for car roofing and headlining than wood, and when car windows were shaded by lattice shutters of wood a tremendous amount of labor was expended in working this raw material into the form necessary to do its work.

Today Agasote and Pantasote come to the car builder as finished materials ready for use.

Not only is the resulting saving of labor very great but these materials also develop far greater durability and economy in maintenance.

The Pantasote Co.

11 Broadway, New York **People's Gas Bldg., Chicago, Ill.**
797 Monadnock Bldg., San Francisco Cal.

INTERNATIONAL Coin Registers

Get More Money and Save Power Through Quicker Fare Handling

Do you recall that passage in J. F. Layng's article in the Jan. 5, 1918, issue of the ELECTRIC RAILWAY JOURNAL reading:

> "To make the conductor reach up or out to some remote point to pull a bell rope instead of pushing a button on a fare box pedestal seems a trifle; but for the combined stops on a run it surely involves the loss of enough fractions of a second to be exceedingly important."

So even if your conductor or conductress is tall enough to reach the bell cord, there has been unnecessary tiring motion and, consequently, distraction and waste of time.

Distraction means missed fares, waste of time in fare handling means waste of power, for as Mr. Layng's article also shows:

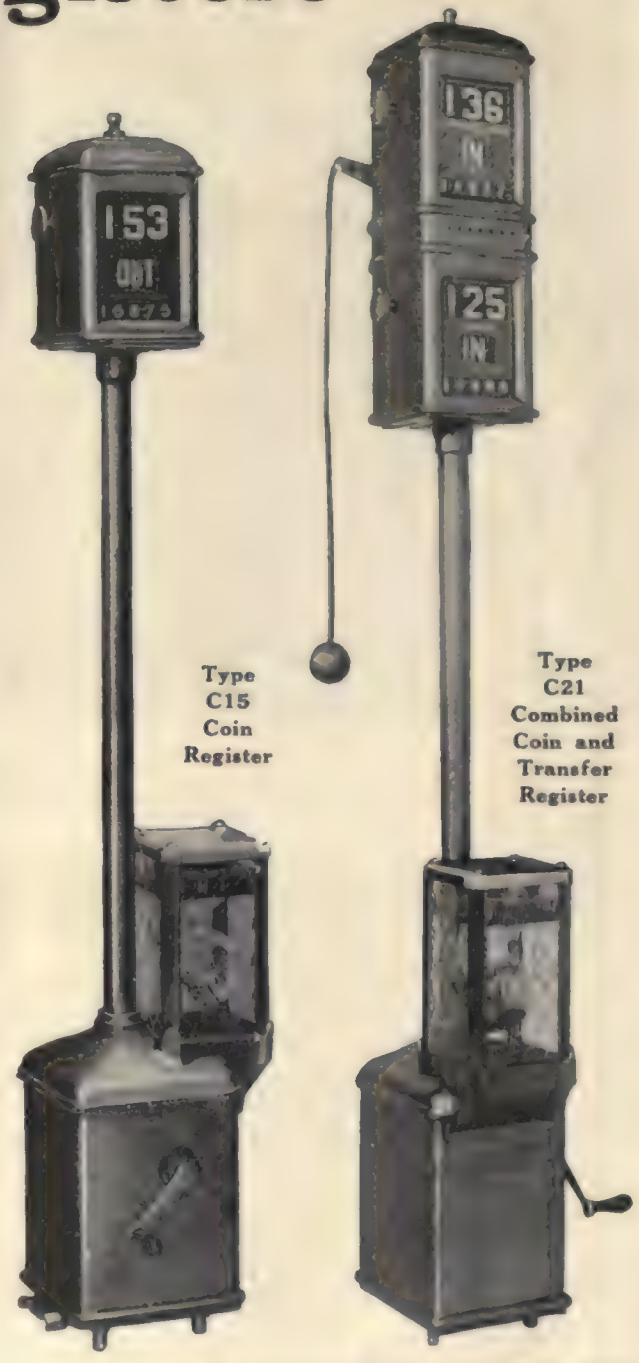
Long Stops are Power Thieves

When you make it possible to collect fares quickly by using International Coin Registers, the length of stop is cut down.

And when the length of stop is cut down, the motorman has more time to make his schedule and to save power by coasting.



Type C16, Fare Box



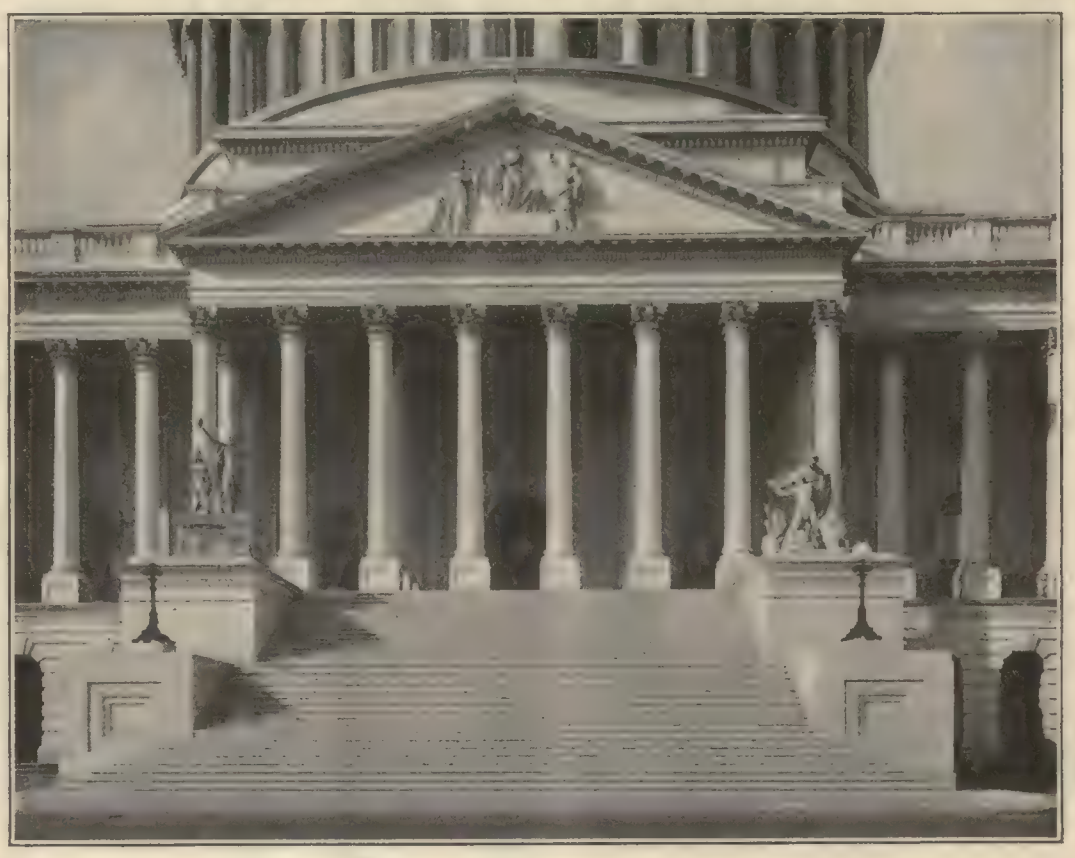
Type C15 Coin Register

Type C21 Combined Coin and Transfer Register

The International Register Company

15 South Throop St., Chicago, Ill.

Specialized Experience In Fare Collection That Will Help You Avoid the Errors of Others in the Past.



Collier Service at Washington

The splendidly modern rolling stock which the Capital Traction and Washington Railway & Electric Company have just ordered to give better service is as far ahead of the plodding horse-car as the

Collier Car Card Service in all Washington cars is ahead of the poor and unreliable car advertising contracts that were characteristic of the business before the founding of a

Nation-wide organization whose size and specialized facilities have made it possible to stabilize the value of the street car as an advertising medium.

Barron G. Collier INCORPORATED

Candler Building

220 West 42nd Street, New York City

Nevasplit Headlinings



International Railway, Buffalo, N. Y., as noted in last week's ELECTRIC RAILWAY JOURNAL, has ordered thirty new cars of the G. C. Kuhlman Car Company, the specifications of which follow:

Number of cars ordered	30
Name of road	International Railway Co.
Date order was placed	Jan. 28, 1918
Date of delivery	April 1, 1918
Builder of car body	G. C. Kuhlman Car Co.
Type of car	Witt
Seating capacity	Approximately 54
Weight	35,640 lb. (estimated)
Bolster centers, length	25 ft. 6 in.
Length over bumpers	50 ft. ¾ in.
Length over vestibule	49 ft. ¼ in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	10 ft. 8¼ in.
Body	Semi-steel
Interior trim	Natural cherry
Headlining	Nevasplit
Roof	Plain arch
Air brakes	Westinghouse
Axles	Brill
Bumpers	Rico anti-climber
Trimmings	Polished brass
Seats	West K

Interior view of one of 26 new cars just put into service by the South Covington & Cincinnati Street Railway.

Specified for the 30 new cars of the International Railway

Another link in the long chain of NEVASPLIT cars.

Just glance at the illustration and note the smooth, neat surface of the headlining. NEVASPLIT is a wood fibre of the highest quality and therefore its uniform, even surface takes paint readily with most pleasing results.

NEVASPLIT will not shrink or warp, "check" or split. It is waterproof and of minimum conductivity. And it will add safety and beauty to your car interiors, either as headlining insulation roofs or as interlining.

If you are unfamiliar with *all* the many qualities of NEVASPLIT, how it positively insures a saving in money, we will gladly send samples and descriptive bulletins.

Write for full particulars.

The Keyes Products Company

120 Broadway, New York

NEW YORK
W. R. Kerschner Co., Inc.
50 Church St.

SAN FRANCISCO
Ford & Geirrine
Merchants' Exchange Bldg.



These Columbia Tools

can turn out Bearings for you at once





YOU will understand the perfection of Columbia-made products when we tell you that we have several hundred machine tools alone.

Practically each tool, be it drill, shaper, borer, grinder, planer or lathe, is handled by the same man day in, day out.

Such specification inevitably results in turning out the best possible work.

That's only one of many reasons for using Columbia-made products.

Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St.

Brooklyn, N. Y.

TOOLS

Armature and Axle Straighteners
Armature shaft straighteners
Armature buggies and stands
Babbitting molds
Banding and heading machines
Car hoists
Car replacers
Coil taping machines for armature leads
Coil winding machines
Pinion pullers
Pit jacks
Signal or target switches
Tension stands

W. R. Kerschner Co., Inc., N. Y.
Holden & White, Inc., Chicago
F. F. Bodler, San Francisco



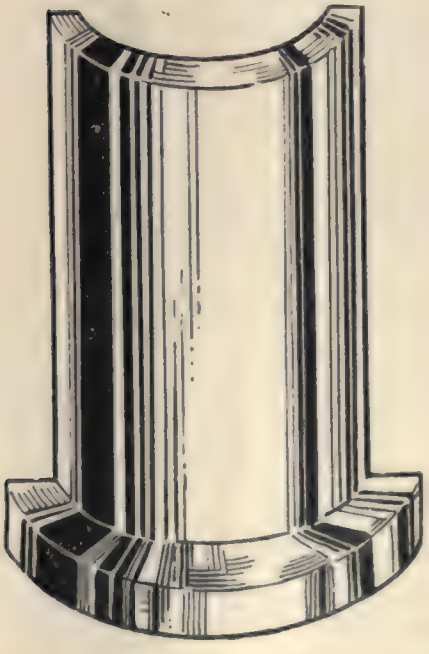
CAR EQUIPMENT

Armature and Axle Bearings
Armature and field coils
Bearings (Axle and Armature)
Brush-holders and brush-holder springs
Brake, door and other handles
Brake forgings, riggings, etc.
Car trimmings
Commutators
Controller handles
Forgings of all kinds
Gear cases (steel or mall. iron)
Grid resistors
Third-rail shoe beams and accessories
Trolley poles (steel) and wheels

Vim Bronze Bearings

for Trucks and Motors

Guaranteed
Against Breakage



Send for particulars

ELECTRIC RAILWAY SUPPLIES

Bemis Car Truck Company

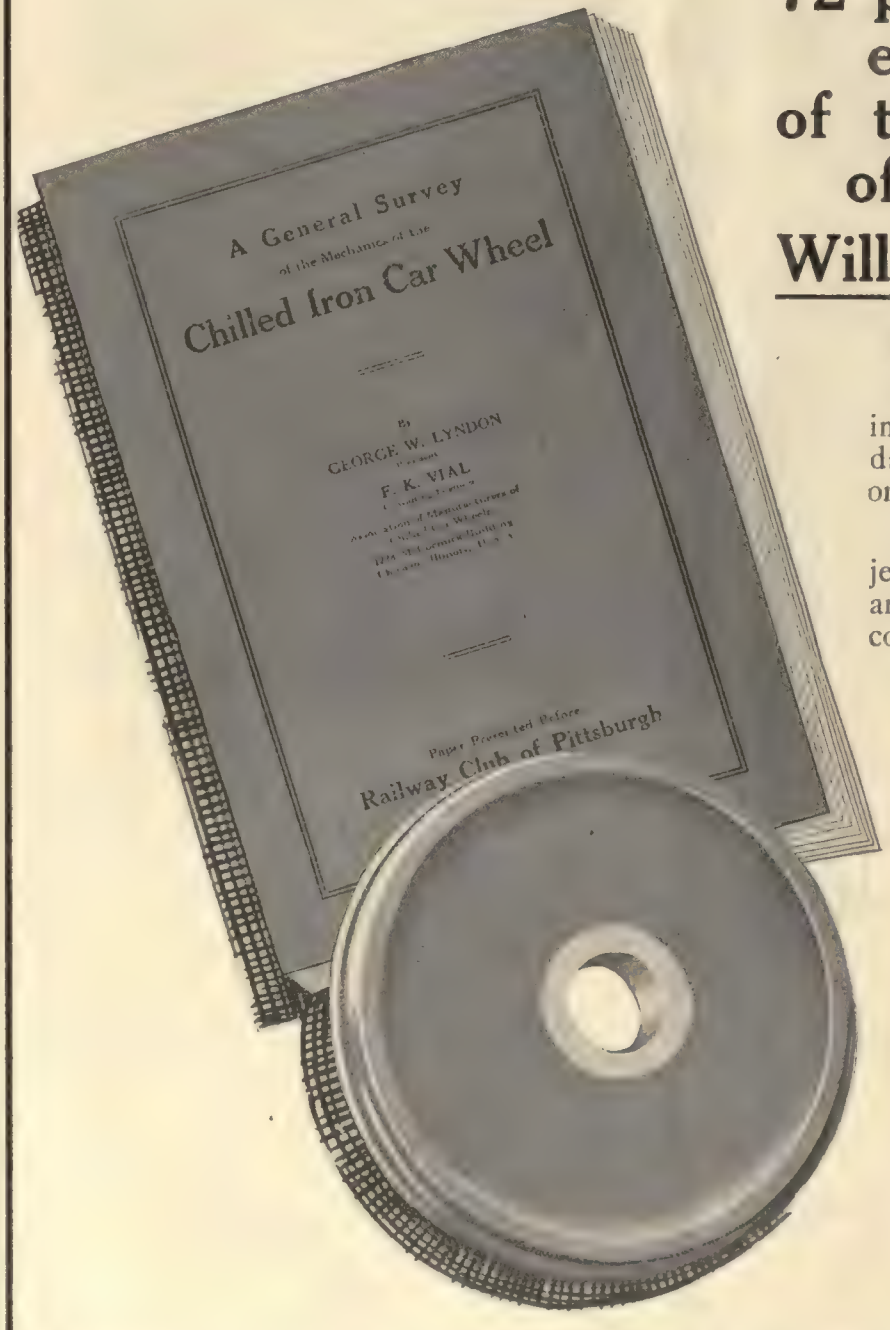
SPRINGFIELD MASS

Here Is a Valuable Book for Railway Men

72 pages covering every phase of the mechanics of car wheels

Will Be Sent Free

upon Request



A veritable storehouse of interesting information and data—all with a vital bearing on operation and maintenance.

Among the thirty-three subjects covered by tables, graphs and discussion are: Areas of contact, the effect of coning, brake shoe loss, shoe pressure, flange pressure, gauge points, obliquity of traction, coefficient of friction as applied to shoe and wheel tread; and stresses developed by (A) vertical loads, (B) brake shoe friction, (E) axle pressure.

The above only *suggests* the scope of its survey—it is a compilation of authentic statistics and facts, stated, tabulated and discussed in proper sequence.

Send for it immediately; besides being instructive at first reading, it will become an invaluable daily reference book. It will be sent to you *without cost.*

Association of Mfgrs. of Chilled Car Wheels

1228 McCormick Bldg., Chicago

Representing Forty-eight Wheel Foundries Throughout the United States and Canada. Capacity 20,000 Chilled Iron Wheels Per Day

OKONITE

TRADE MARK
REG. U. S. PATENT OFFICE.

The Standard for Rubber Insulation

Railway Feed Wires insulated with OKONITE are unequaled for flexibility, durability, and efficiency and are in use by the leading Electric Street Railway Companies. OKONITE is preferred above any other insulation for Car Wiring, Telegraph and Telephone Purposes.

OKONITE WIRES—OKONITE TAPE
MANSON TAPE—CANDEE WEATHERPROOF WIRES
CANDEE PATENTED POTHEADS

Samples and Estimates on Application

THE OKONITE COMPANY, 501 Fifth Ave., cor. 42nd St., New York

CENTRAL ELECTRIC CO., Chicago, Ill., General Western Agents

F. D. Lawrence Electric Co., Cincinnati, O. Novelty Electric Co., Philadelphia, Pa. Pettingell-Andrews Co., Boston, Mass.



You Can Minimize Overhead Repair Work

and successfully cut maintenance costs if you turn to

The Macallen Line

of strain insulators, hangers, splicing ears, crossings, and other overhead material.

They are "specialty" products, designed and built to make "Macallen" the standard on American railways.

It will pay you to write for information and prices.



The Macallen Insulating Joint

Adopted by principal air brake manufacturers as part of their standard equipment. Also insulates steam pipes, etc. Shell is seamless drawn steel, nipples are machined from steel rod, and insulating material is Macallen Vulcanite Compound, not affected by heat or oil—practically indestructible.



May We Send Our Catalog?

TRADE MACALLEN MARK

The Macallen Company

Macallen and Foundry Sts., Boston

TRADE MACALLEN MARK

DU PONT AMERICAN INDUSTRIES

Reduce Maintenance Costs

By Adopting Quicker, Cheaper and Labor-Saving Methods

With the track and construction crews reduced by the country's call, every labor-saving agency must be employed to enable the work of track-repairing and extension to be accomplished with the remainder of the force.



By the Use of Red Cross Explosives

to blast earth, shale and gravel ahead of graders and steam-shovels; to demolish culverts, piers, log and ice-jams; improve drainage conditions; prepare pole and post holes; shatter stumps and boulders, it will be found that Red Cross Explosives are actual labor savers in a very practical manner.

Lower Your Expenses

by adoption of labor-saving methods based on the extensive experiences of our field forces while investigating the blasting operations required to construct the nation's railways. Tell us your blasting problems —let us help you to reduce your maintenance costs.

E. I. du Pont de Nemours & Co.
Wilmington, Delaware

NOTE: When in Atlantic City, visit Du Pont Products Store, Boardwalk and Penn. Avenue.

The Du Pont American Industries Are:

E. I. du Pont de Nemours & Co., Wilmington, Del., Explosives.
Du Pont Chemical Works, New York, Pyroxylin and Coal Tar Chemicals.
Du Pont Fabrikoid Co., Wilmington, Del., Leather Substitutes.
The Arlington Works, 725 Broadway, New York, Ivory Py-ra-lin and Cleanable Collars.
Harrison Works, Phila., Pa., Paints, Pigments, Acids, Chemicals.
Du Pont Dye Works, Wilmington, Del., Dyes and Dye Bases.

MAIL THIS COUPON } Mark X before subject of interest and send with address to Adv. Div. E. I. du Pont de Nemours & Co., Wilmington, Delaware. (El. Ry. Jnl.)

☐ Explosives	☐ Varnish	☐ FABRIKOID
☐ Blstg. Powder	☐ Com'l Acids	☐ Auto Top M't'l
☐ Blstg. Supplies	☐ Ethers	☐ Fairfield Cloth
☐ Sptg. Powder	☐ Solvents	☐ PY-RA-LIN
☐ Trapshooting	☐ Dyes & Bases	☐ Tar Distillates
☐ Paints	☐ Bridgeport Wood Finish	☐ Ref'd Fusel Oil
☐ Enamels		

DU PONT

ROEBLING WIRES AND CABLES



Wire for Electric Railways

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY

Agencies: New York, Boston, Chicago, Philadelphia, Pittsburgh, Cleveland, Atlanta, San Francisco, Los Angeles, Seattle, Portland, Ore.

CYPRESS

"THE WOOD ETERNAL"

is NOT the *Best Lumber for ALL Railway Purposes*. For certain specific applications, however, in which railways have large lumber requirements, the use of all-heart Cypress develops very large *economies* in *maintenance costs*. For example, the Railway Signal Association in its standard specifications for wood to be used for "Trunking and Capping" has always placed all-heart Cypress among the first choices in the list of suitable woods.

The Railway Signal Association makes its recommendations as a result of definite *knowledge* of the subject, and its membership includes many able men who are Cypress enthusiasts. We gladly refer all doubters as to Cypress superiority to any well-posted railway engineer who has had experience with Cypress, "the wood eternal."

The same conditions of service which make Cypress superior for "Trunking and Capping" are present in many other railway lumber requirements, such as

FENCING

and similar purposes where the material is exposed constantly to the weather, and where it is consequently essential that it shall be highly capable of *resistance to decay*. That is the great and particular value of Cypress—it is *highly resistant to decay*. (All-heart especially.)

If railway men in general will study the question of wood durability for other uses as carefully as Railway Signal men have studied it in connection with "Trunking and Capping," there will be a lot more all-heart Cypress used in railway service—*to the very great economy of the companies using it.*

Our data is at your service.

SOUTHERN CYPRESS MFRS' ASS'N

1265 Hibernia Bank Building, New Orleans, La., or
1265 Heard National Bank Building, Jacksonville, Fla.

The Continued Success of Colonial Copper Clad Wire

Trade C.C.C. Mark

is due to the perfection and continued supremacy of weld between the copper and steel, and an expert knowledge of and skill in the production and uses of high grade electric wire and cable products.

For over 10 years, C. C. C. Wire has maintained its supremacy. During that period it has been continuously produced according to the same methods in millions of pounds yearly for the most exacting buyers of wire products for electrical uses.

Colonial Copper Clad Wire has been produced continuously for a longer period and in larger quantities than the combined quantities and periods of manufacture of all other past or present competitive products. It has stood the "acid test" of time in service tests and unbroken continuity of manufacture as no other wire has done.

It is probably not overstating the case to say that Colonial Copper Clad Wire is the only copper clad wire that has been produced in which a thorough weld is secured between the copper and steel—a weld made by the pressure between two accurately centralized, previously treated and prepared plastic metals, in exactly the same way in principle that the blacksmith welds his two pieces of iron into a single piece of equal or greater strength than the original bars. The most exacting tests of twisting, pulling, hammering, heating and quenching, immersion in acids, etc., fail to indicate that the union between copper and steel in Colonial Copper Clad Wire is not of a strength substantially equal to the strength of the copper itself. A weld of this sort must not be confused with a union where the metals are merely melted together.

Do not be misled, but write for Bulletin No. 202 for further information about C. C. C. Wire.

Standard Underground Cable Co.

Pittsburgh, Pa.

Boston, New York, Philadelphia, Atlanta, Washington, Pittsburgh, Minneapolis, Chicago, Detroit, St. Louis, San Francisco, Los Angeles, Seattle, Salt Lake City

For Canada: Standard Underground Cable Co. of Canada, Limited, Hamilton, Ont.



Line Specialties in Greater Varieties

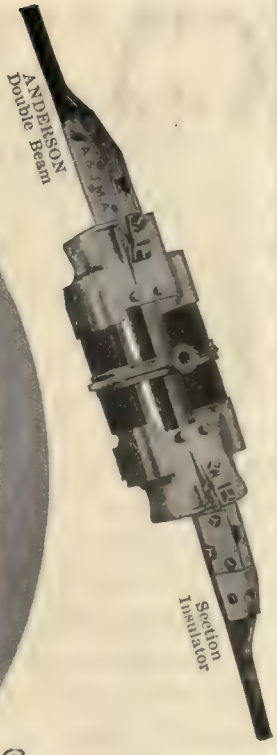
Est. 1877

Albert & J. M. Anderson Mfg. Co.
289-293 A Street
Boston, Mass., U. S. A.

All Our Products Are Quality Products



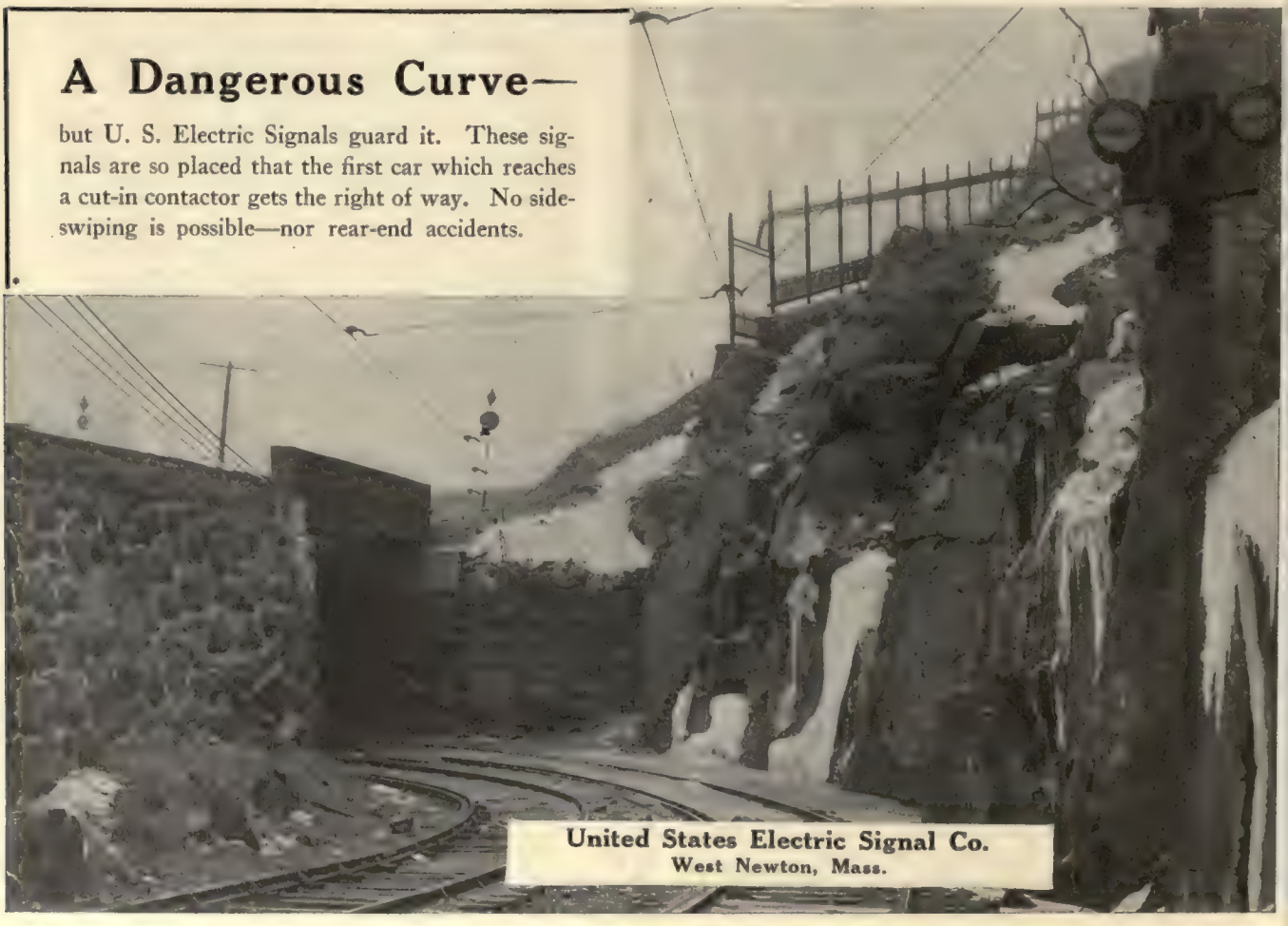
ANDERSON Trolley Wheel



BRANCHES:
New York, 135 Broadway.
Chicago, 105 So. Dearborn Street.
Philadelphia, 429 Real Estate Trust Building.
London, E. C., 48 Milton Street.

A Dangerous Curve—

but U. S. Electric Signals guard it. These signals are so placed that the first car which reaches a cut-in contactor gets the right of way. No side-swiping is possible—nor rear-end accidents.



United States Electric Signal Co.
West Newton, Mass.

Why Accept Less Than RIMCO Rubber Insulated PLIERS Offer?

Why buy pliers protected by detachable soft-rubber handles?

Rimcos are cheaper because they mean ***safety.***

Hard rubber cracks and breaks when dropped from a height.

Rimcos last longer!

Rimco insulation, being *semi-soft* neither breaks nor cracks when pliers are dropped from a height upon hard surface.

Rimco Rubber Insulated Pliers protect your men from the dangers of high tension work.

So, why pay more or even the same for less than Rimcos offer?



Rimco Pliers are tested and guaranteed to 10,000 volts.

Read the guarantee tag on every pair.

Write for Illustrated Circular today.

The Rubber Insulated Metals Corporation

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Plainfield, N. J.

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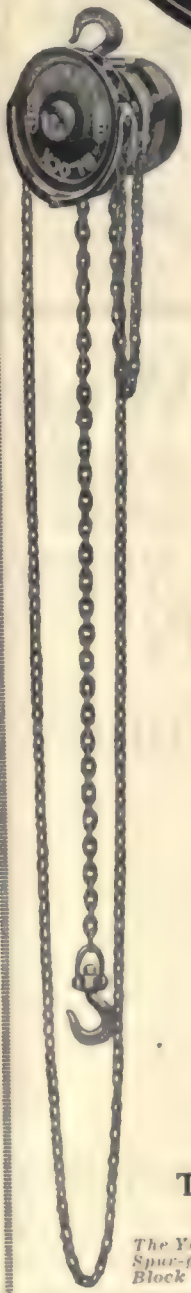
National Railway Appliance Co., 50 East 42nd St., New York City.

Canadian Agent: Lyman Tube & Supply Co., Ltd., Montreal, Toronto and Winnipeg.

TRADE YALE MARK



Yale Spur-geared Block handling Motor.



The Yale Spur-geared Block

The Yale Spur-geared Block

For Critical Hoisting

Every shipyard on the coast is asking for Yale Blocks.

Made in capacities ¼ to 40 tons, there is a size to meet every need—whether it is in a small plant where the safe and economical handling of loads is essential, or in a great industry where the load problem is a vital factor.

The guarantee is in the block itself. Each part of the Yale Block is carefully inspected as a unit and inspected again in the assembled block—which must pass a test load of 3360 pounds to the rated ton (50% overload).

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Put your hoisting problems up to us

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All products closely inspected, carefully finished and fully guaranteed

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Your men will be able to do every kind of welding on the track, in the barn or in the shop with the

LINCOLN Bonding Machine

A high efficiency machine that can be moved anywhere right up to the work by the operator.

A money saver in reclaiming broken parts. A current saver, as it does not take more than 10 kw. from the trolley line to operate the machine up to its maximum capacity.

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Some roads have actually saved the full cost of the machine during the first month.

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Thorough Lubrication—An Important Feature of Allis-Chalmers Air Compressors

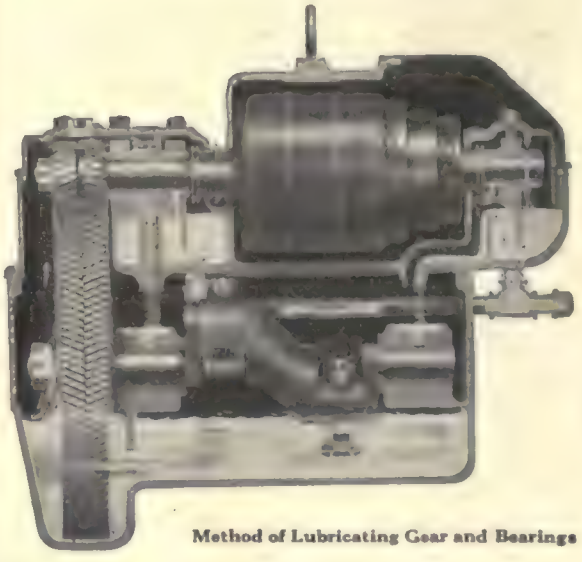


The thoroughness with which this important detail has been worked out is an index to the complete design and careful construction of these improved compressors for air-brake equipments.

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Bulletin 1525A sent on request.

Allis-Chalmers Mfg. Company
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Method of Lubricating Gear and Bearings

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protect millions of circuits and billions of dollars' worth of property in thousands of plants representing every branch of industry.

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Any Railway Shop Could Make Good Use

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Hydraulic Straightening Press for straightening bars, trolley poles, shafts, etc.

We have furnished many railway shops with hydraulic presses for straightening, bending, force fitting and for doing hundreds of odd pressing jobs so common in all shops.

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Write for Catalogs.



Portable Hydraulic Press for forcing Bushings, Gears, etc.

W-S HYDRAULIC

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W-S HYDRAULIC

415

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THE UNITED STATES RUBBER CO. NEW YORK — FRICTION TAPES — SPLICING

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We Make 100 Varieties of Ticket Punches But Only *One Quality*

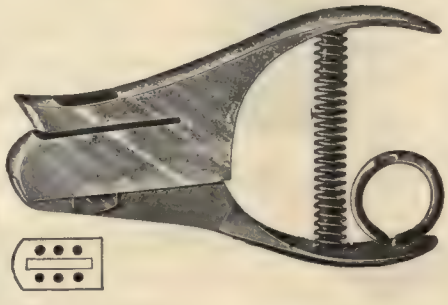


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Makes an Economical and Durable Car Seat Covering—

It costs less than the poorest leather and serves better than the best.



Interior of Center-Entrance Car for New Buffalo-Niagara Falls Line with Du Pont Fabrikoid seat upholstery.

Du Pont Fabrikoid is waterproof—grease-proof—stain-proof—and washable.
Du Pont Fabrikoid is uniform throughout and saves time, labor and waste in cutting.
Du Pont Fabrikoid is easily applied, attractive in appearance and sanitary.

We will send samples and prices on request.



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Railroad Department Representatives: 61 Broadway, New York

DU PONT

Trade-Mark

BOUND BROOK OIL-LESS BEARINGS

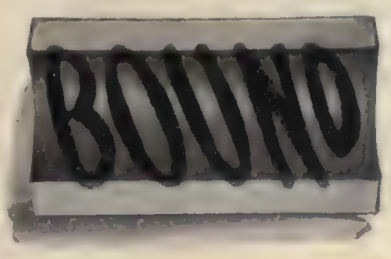
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"Bound Brook" is not merely a *trademark* signifying a certain type of bearing; it is far more than that.

It is the *visible* sign of national leadership—the best electric railways of America, from the Atlantic to the Pacific, believe in it.



The trolley wheel bushing may seem a very small factor in reliable operation and economic maintenance, but the railroad man knows that economies should start at the point where the current is taken from the wire.



Genuine Graphited Oil-less Bearings are made only at
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EMB Grid Resistors

ARE MADE RIGHT AND STAY RIGHT

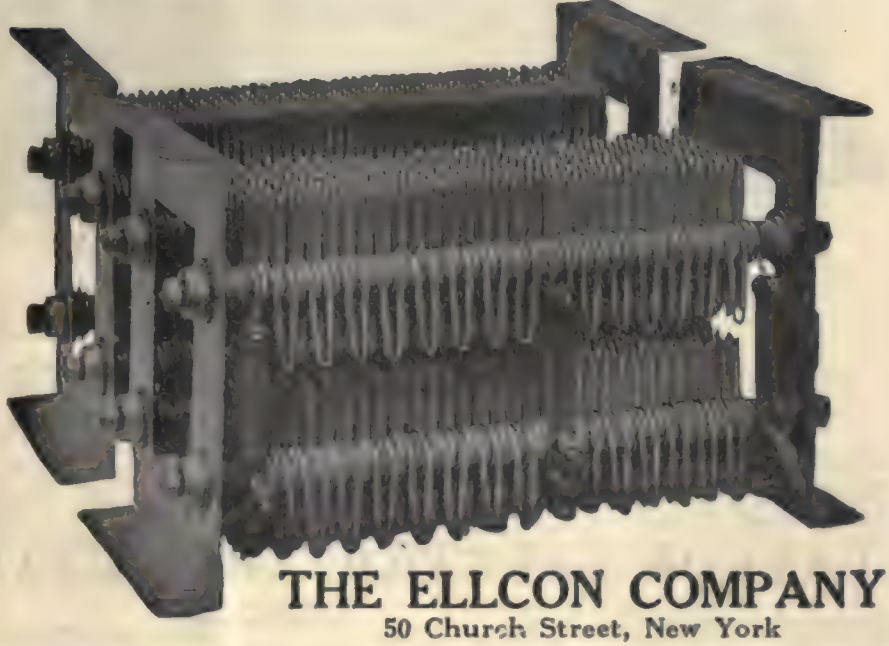
No resistors get more abuse than those under a car.

They are abused electrically by careless operation of the controller.

They are abused mechanically by exposure to dusty, muddy and stone-littered streets.

Until the arrival of E M B drawn, non-corroding grid resistors, troubles from these sources seemed unavoidable.

E M B grid resistors actually have made this part of your equipment troubleproof.



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Raise Your Schedule Speed and Operate Fewer Cars



Better pleased patrons and better profits have always resulted from the installation of

RAILWAY ROLLER BEARINGS

Big savings in power are made by the decreased friction and the longer wasting periods that naturally follow.

Less oil is required by the inclosed dust-proof and oil-tight design which provides continuous lubrication without waste of oil.

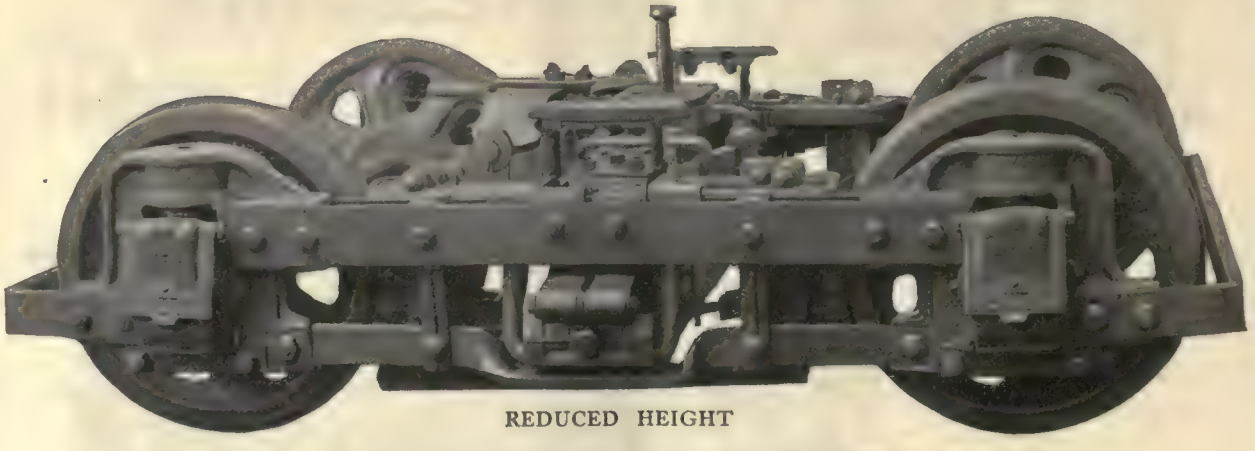
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Interesting city, suburban and interurban performance data is available. Shall we send it?



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Syracuse, New York

R. H. TAYLOR REDUCED HEIGHT TRUCK



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TAYLOR R. H. TRUCK

Mounted on 26-Inch Wheels With Springs Over Journal Boxes
Designed to Mount Centre and End Entrance Cars Low Down

SWING MOTION AND FULL ELLIPTIC SPRINGS

Wheel Base 5 ft. 2 in. For Car Bodies weighing 16,000 to 22,000 lb. Motors Inside Hung.

EASY RIDING

Journals 3¾ x 7 M.C.B. Type. Height from Rail to Body Bolster, 22¾ in. Brakes Inside Hung.

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Established 1892

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Shifting, or shiftless, labor cannot turn out a first-class product.

Our workmen consider their positions permanent—which explains the quality of St. Louis-built cars.

When in need of new cars it will pay you to consult our engineers.

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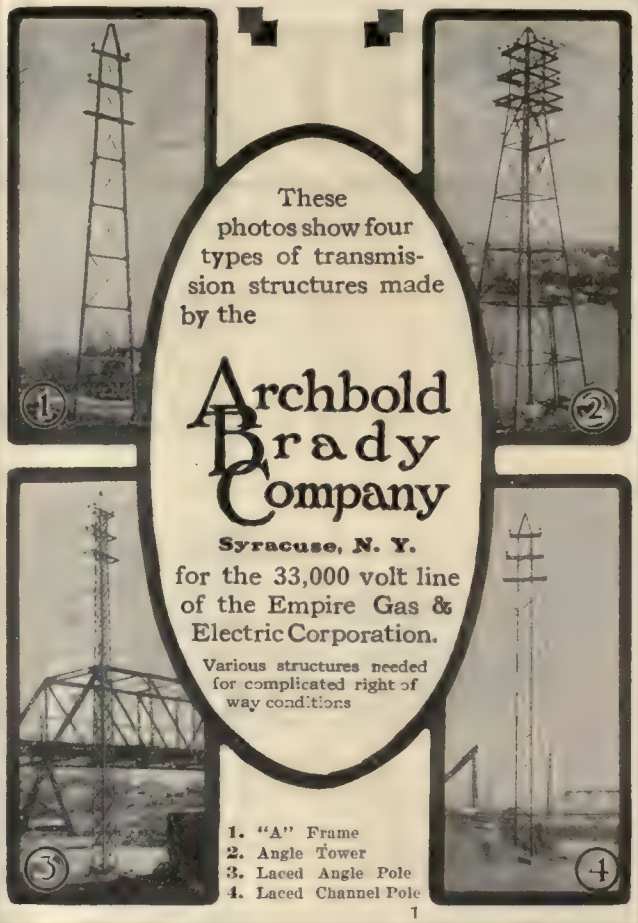
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Strongest STEEL POLE of like weight in the world.
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Most artistic STEEL POLE in the world for any service.
We make the lowest prices.
We have constantly on hand about two thousand tons of steel and can make immediate shipments.
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Various structures needed for complicated right of way conditions

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Also built in double this capacity for big jobs.

Send today for free catalog that shows a Jaeger Mixer built to your individual needs.

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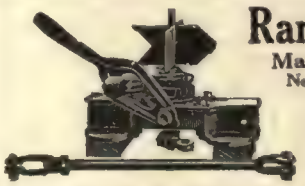
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Woolworth Building, New York
Boston Chicago



7232

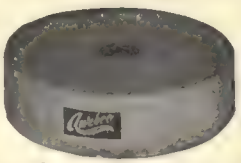
Cameron Commutators Command Confidence. Why?

Because of the dense, high conductivity hard-drawn copper we put into the bars.
Because of the best-there-is quality of high grade Canadian amber mica we use in insulating the segments.
Because of years of specialized, commutator-building experience that makes our workmen experts in their line.
Because of the Cameron ideal of quality—and the painstaking inspection that guarantees it in every job we turn out.
Specify CAMERON for **commutators, segments or coils.**

Cameron Electrical Mfg. Co.

Ansonia, Connecticut

Awebco
TRADE MARK REG'D



Anchor Webbing Co.

Mills: Woonsocket and Pawtucket, R. I.
Office: 300 Brook St., Pawtucket, R.I.

Tapes and Webbings

are produced according to the specifications laid down by Railway Motor Manufacturers. Popular with manufacturers of motors because always right as to width and thickness of material, breaking strength, yarns, warp ends, and other standard requirements. The prices and material invariably satisfactory.

Representatives: Chicago—E. P. Bartlett & Co., 15 No. Jefferson St. St. Louis—Geo. A. Anderson, Leather Trade Bldg. Cleveland, Ohio—Mueller Electric Co., 423 High Ave., S. E.

FORD TRIBLOC

A Chain Hoist that excels in every feature. It has Planetary Gears, Steel Parts, 3½ to 1 factor of Safety. It's the only Block that carries a five-year guarantee.

FORD CHAIN BLOCK & MFG. CO.
142 Oxford Street, Philadelphia

M-R INSULATION MFG CO

"Everything in Insulation"

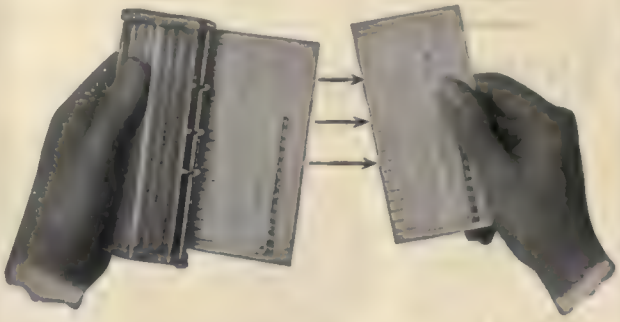
Mica
Vulcanized Fibre
Varnished Cloth
Insulating Tapes
Waxes
Asphalts
Compounds
Insulating Varnish

The above are only a few of our products
Write us for anything in this line you may require.

MITCHELL-RAND M'F'G CO.
103 John St., New York City

For
Insulating your Commutators
use HANDYLAC
a clear quick-drying varnish
Ask us about it.
THE HANDY SUPPLY CO.
11737 Detroit Ave., Cleveland, Ohio

Repair Shop Machinery and Cranes
Built by
NILES-BEMENT-POND CO.
111 Broadway, New York
Boston Philadelphia Pittsburgh Chicago
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Automatically
is a pretty long word to use when describing the Macdonald Cash Receipt Holder.
It takes longer to say it than the Macdonald takes to complete the transaction.
Click!—that's all!

Send for Sample Holder.
The Macdonald Ticket & Ticket Box Co.
Cleveland, Ohio

CONDUCTOR 1921 AMER. RY. SUPPLY CO.

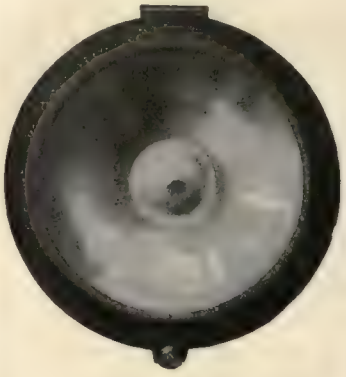
Get Our Price Lists on
BADGES and PUNCHES
AMERICAN RAILWAY SUPPLY CO., 134-136 Charles St., NEW YORK

WATER SOFTENING OR FILTRATION
FOR BOILER FEED AND ALL INDUSTRIAL USES
WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.


IMPERIAL WELDING AND CUTTING EQUIPMENT
OXY-ACETYLENE PROCESS
Welds everything in metal—cuts anything in steel or wrought iron. Excels in Speed, Safety, Efficiency and Economy. Write for Free Catalog.
The Imperial Brass Mfg. Co., 525 S. Racine Ave., Chicago

The MODERN WAY of handling ASHES is by the
GECO
GECO
STEAM JET CONVEYOR
GREEN ENGINEERING CO.
East Chicago, Indiana
Bulletin No. 1 Green Chain Grate Stokers.
Bulletin No. 2 Geco Steam Jet Ash Conveyors.

The Big Three
D & W Fuses, Deltabeston Wire
D & W Oil Fuse Cutouts
D & W Fuse Co., Providence, R. I.



The McLain No. 25 Headlight

gives powerful road illumination, at the same time eliminating glare. It is an extended dash type light made of Pressed Steel throughout, assuring light weight without any sacrifice in strength or durability. It is absolutely waterproof, weather proof and solid.

Concentrated filament type using either a 23 or 36 watt lamp.

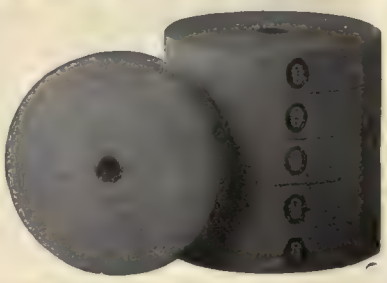
It's the LIGHTEST, BRIGHTEST, TIGHTEST headlight on the market and it doesn't cost any more than the others.

The Trolley Supply Co., Canton, Ohio

HOPE Brand *for best results*

Webbings and Tapes made from the best raw materials—made with the most up-to-date machinery and most reasonably priced. That's what you get in Hope Products.

Send for samples.



HOPE WEBBING CO.

Providence, R. I. 396 Broadway, New York

WE CAN CUT YOUR COST OF

HEATING CURRENT

Write for THERMOSTATIC CONTROL INFORMATION

GOLD

ELECTRIC HEATERS Cut Installation and Maintenance Charge.
VENTILATORS Also Ventilate in Stormy Weather.
THERMOSTATS Save Current.
ORIGINATED the use of NON-CORROSIVE Wire for Electric Car Heaters.
ORIGINATED The Ventilated Coil Support.

LET US FIGURE ON YOUR NEXT REQUIREMENTS

Gold Car Heating & Lighting Co., 17 Battery Pl., New York

The Best Shade Rollers for Cars

SPECIAL shade rollers for cars, that will last and give satisfaction for years, and yet cost but little more than the poorest you can buy, are made by the Stewart Hartshorn Co., E. Newark, N. J. This company is by far the largest shade roller manufacturer in the world. It is able to give high quality at lower prices because of the enormous output. Write for catalog, stating wants. You are always protected when you buy shade rollers if they bear the signature *Stewart Hartshorn*

Heating and Ventilating

Let us demonstrate to you how we can heat and ventilate your cars at the lowest possible cost.

The Cooper Heater Company
Carlisle, Pa.

Simplex Jacks

for

Railroads - Contractors - Industries
Automobiles - Pole Pulling and Ordnance

Templeton, Kenly & Co., Ltd.

Established 1899
London Chicago Paris

Hot Air — Hot Water — Electric

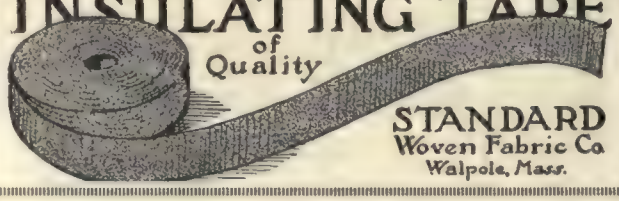
HEATERS

Also Thermostatic Control

THE PETER SMITH HEATER CO., Detroit, Mich.

INSULATING TAPE

of Quality

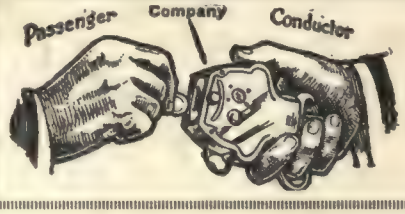


STANDARD
Woven Fabric Co.
Walpole, Mass.

UNIVERSAL ANTI-SLIP TREADS

cars and station steps.

Universal Safety Tread Company
Waltham, Mass.



Direct Automatic Registration
By the
Passenger

Rooke Automatic Register Co.
Providence, R. I.

HORNE RAILWAY DEVICES

Horne Double Acting Brakes
Giant Geared Brakes
Differential Staffless Brakes
Sterling Safety Brakes
Sterling Trolley Bases
Sterling Sand Boxes
Lord Screenless Air Cleaners for Compressors
Q-P Trolley Catchers
Hydrogrounds and Lightning Arresters
Fenders and Wheelguards
Controller Fingers
Friction and Rubber Tape
Packing and Gaskets
Air Hose and Rubber Specialties

HORNE MANUFACTURING CO., 50 Court St., Brooklyn, N. Y.



Our forty years of successful punch making are well demonstrated in the perfection of our product, which is Standard throughout the world.

These punches prove the most efficient, because they operate quickest and easiest, and the most economical because they wear longest.

Let us show you WHY.

Punchmakers since '72.

R. Woodman Mfg. & Supply Co.
82 Sudbury St., Boston, Mass.



E. G. Long Co., 50 Church St., New York City
Eastern Electrical and Export Representatives.



You will buy

CLEVELAND Fare Boxes

Eventually—

Why not now?

Cleveland Fare Box Co.
CLEVELAND, OHIO

The Kalamazoo Trolley Wheels

have always been made of entirely new metal, which accounts for their long life WITHOUT INJURY TO THE WIRE. Do not be misled by statements of large mileage, because a wheel that will run too long will damage the wire. If our catalogue does not show the style you need, write us—the LARGEST EXCLUSIVE TROLLEY WHEEL MAKERS IN THE WORLD



THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

TIGER BRONZE

The care you give to the selection of bearings now measures the number of replacements you'll have to face later. Tiger Bronze Axle and armature Bearings lengthen the interval between renewals.

MORE-JONES BRASS & METAL CO.
St. Louis, Mo. U. S. A.

BRONZE BEARINGS

Railroad and Tram Car Specialties

New inventions developed, perfected and worked for the English market

Messrs. G. D. Peters & Co., Ltd.
Moorgate Works, Moorfields, LONDON, E. C.

JACKS

Barrett Track and Car Jacks
Barrett Emergency Car Jacks
Duff Ball Bearing Screw Jacks
Duff Motor Armature Lifts

The Duff Manufacturing Co., Pittsburgh, Pa.

VAN DORN COUPLERS

are made for every condition and requirement. M. C. B. Pin and Link, Car and Air, in all sizes and types.

VAN DORN COUPLER CO.
2325 So. Paulina St., Chicago, Ill.



Use them in your terminals—
PEREY TURNSTILES or PASSIMETERS
Faster than the ticket seller

Perey Manufacturing Co., Inc.
30 Church Street, New York City

RAILWAY UTILITY COMPANY
Sole Manufacturers
"HONEYCOMB" AND "ROUND JET" VENTILATORS for Monitor and Arch Roof Cars, and all classes of buildings; also ELECTRIC THERMOMETER CONTROL of Car Temperatures.
141-151 WEST 22D ST. Chicago, Ill. *Write for Catalogue* 1328 BROADWAY New York, N. Y.

The "Hycap-Exide" Battery
for
STORAGE BATTERY STREET CARS
THE ELECTRIC STORAGE BATTERY CO
PHILADELPHIA



See the Crank of the
CREAGHEAD DESTINATION SIGN

By means of it, conductor or motorman can change sign without leaving platform. All that has to be done is to turn the crank. Better investigate.

CREAGHEAD ENGINEERING CO., CINCINNATI, O.

MASON SAFETY TREAD—lead or carborundum filled; non-slippery; prevents accidents; cuts out damage suits.
KARBOLITH CAR FLOORING—for steel cars; is sanitary, light weight, fire proof, non-slippery.
STANWOOD STEPS—Self-cleaning, non-slippery, light.
Our products used on all leading railroads, on cars and stations. For details address:
AMERICAN MASON SAFETY TREAD CO., Lowell, Mass.
Branch Offices: Boston, New York City, Philadelphia.
Agencies in all principal cities.

SEARCHLIGHT SECTION

Rails! Cars! Wire!

Material and Equipment
of the
St. Joseph Valley Railway Company
and the
St. Joseph Valley Traction Company
Elkhart, Indiana

Just purchased from the Receiver of the above named Companies their entire Tracks, Rails, Machine Shop Tools, Implements, Wire, Cars, Rolling Stock and material of all kinds.

The St. Joseph Valley Railway Company extended from the town of LaGrange, Ind., to Columbus, Ohio, and the St. Joseph Valley Traction Company extended from the City of Elkhart, Ind., to the town of LaGrange, Ind.

The material is in excellent condition and represents approximately the following:

75 miles of 70-lb. Standard Steel Rails.
240,000 Ties.
2—Steel Bridges.
1—40-ton Locomotive, 8-wheels.
1—45-ton Locomotive, 10-wheels.
1—65-ton Mogul Locomotive, 8-wheels.
1—Combination passenger car.
3—Passenger Cars.
3—Fairbanks-Morse Gasoline Engines.
5—Freight Box Cars.
6—Freight Flat Cars.
1—Box Caboose Car.
4—Engine Water Tanks.
1—Ballast Car.
1—Baggage Car.
9 miles of 350,000 C. M. copper Feed Wire.
10 miles of 000 copper Trolley Wire.
36 miles of No. 9 Iron Wire.
46 miles of No. 10 copper Telephone Wire.
2—Section Speeders.
Shop Machines.
Tools.
Implements.
Section Men's Tools, and
A large quantity of miscellaneous apparatus.

Immediate delivery can be given on any part of this equipment. Inspection can be made from my office in the city of LaGrange, Ind. Inquiries should be addressed to

BENJ. HARRIS
Liquidator
LaGrange, Ind.

TRANSFORMERS

FOR SALE

6—10-Kv.a., 22,000/11,000-220/110 volts. General Electric Transformers, 60-cycle, single-phase, new

2—5-Kv.a., 11,000-220 volts Westinghouse transformers, 7200 Alt., used

2—20-Kv.a., 11,000/10,500/9500-220/110 volts General Electric Transformers, 60-cycle, used

2—30-Kv.a., 2080/2300-230/460 volts General Electric Transformers, 25-cycle, used

2—25-Kv.a., 6600 volts primary General Electric Transformers, 60-cycle, used

Address **W. H. SMAW, Purchasing Agent,** Georgia Ry. & Power Co., Atlanta, Ga.



Armature Coil Taping Machine

Saves Time, Labor and Money

A boy can tape 40 coils for Westinghouse 12A Armature in an hour. Further particulars gladly furnished.

Geo. M. Griswold Machine Co.
New Haven, Conn.

RAILS

RELAYERS—NEW

If you have any to sell, 12 lb. to 100 lb., write, wire or phone us.

GENERAL EQUIPMENT CO
30 Church Street, New York City

RAILS

RELAYERS—NEW

Write, wire or phone us if you need any. 8 lb. to 100 lb. section.

GENERAL EQUIPMENT CO.
30 Church Street, New York City

The Searchlight Advertising in This Paper

is read by men whose success depends upon thorough knowledge of means to an end—whether it be the securing of a good second-hand piece of apparatus at a moderate price, or an expert employee.

The Best Proof

of this is the variety of this journal's Searchlight ads. Without a constant and appreciable *demand* for such machinery or services, by its readers, the market-place which these advertisements represent could not exist for any length of time.

—

Are *you* using the Searchlight Section?

CAR BARGAINS

OPEN and CLOSED
MOTOR and TRAIL

Write for Price and Full Particulars to

ELECTRIC EQUIPMENT Co.
601 Commonwealth Bldg. Phila. Pa.

DOUBLE TRUCK CARS FOR SALE

Four—39 ft. overall closed cars. Two—15-bench open cars.
Three—13-bench open cars. All completely equipped, including air.

Immediate Delivery. Reasonable Price.

WIRE or WRITE

FS-147, Electric Railway Journal
10th Avenue, at 36th Street, New York

FOR SALE

1—90-LB. FROG

with Switch Points, 24° 50″

INDUSTRIAL SERVICE COMPANY
Lincoln, N. J.

SEARCHLIGHT SECTION

Rotary Converters

60-Cycle

1—400-kw. General Electric Rotary Converter, type HC, form P, 6-phase, 60-cycle, 600-volt, D.C., 900-r.p.m., complete with switchboard equipment.

1—300-kw. Westinghouse Rotary Converter, 6-phase, 60-cycle, 600-volt, D.C., 1200-r.p.m., complete with transformer and switchboard equipment.

25-Cycle

4—500-kw. General Electric Rotary Converters, type HC, 3-phase, 25-cycle, 4-pole, 600-volt, D.C., 750-r.p.m. with transformers and switchboard equipment.

1—500-kw. Westinghouse Rotary Converter, 3-phase, 25-cycle, 550-volt, D.C., 550-r.p.m., complete with transformers and switchboard equipment.

1—300-kw. National Rotary Converter, type RT, 3-phase, 25-cycle, 550-volt, D.C., 500-r.p.m., with switchboard equipment.

1—300-kw. Stanley Rotary Converter, SKC, 3-phase, 25-cycle, 600-volt, D.C., 500-r.p.m.

1—250-kw. General Electric Rotary Converter, type TC, 3-phase, 25-cycle, 550-volt, D.C., 750-r.p.m.

We shall be glad to mail complete list of Electrical, Steam and Hydraulic Machinery upon request.

MacGOVERN & COMPANY, Inc.
114 Liberty Street, New York, N. Y.

Complete Power Plant

Delivery Approx. May 1st

2—780 KVA Westg. Turbo Outfits, 3-ph. 60-cy., 2400-V., 3600 R.P.M., complete with switchboards and exciter units; also condensing apparatus. 4-338 H.P. Keeler Water Tube Boilers with breeching, stack, pumps.

TURBINES

1—2500 KVA. Gen. Elec. Curtis Horz. Turbo Outfit, 2-phy., 60-cy., 2300-V., 3600 R.P.M., 150-lb. steam pressure, with Westg. Le Blanc Condenser.
1—500 Kw. Gen. Elec. Curtiss Turbo Outfit, 3-ph., 60-cy., 2300-V., 1800 R.P.M., 150-lb. steam pressure. Vert. type.
1—500 Kw. Westg. Horz., 3-ph., 60-cy., 360-V., 3600 R.P.M. Turbo Outfit.
1—100 Kw., Gen. Elec. Turbo Outfit, 3-ph., 60-cy., 2300-V., 3600 R.P.M., 125-lb. steam pressure.

ARCHER & BALDWIN, Inc.
114-118 Liberty St., New York, N.Y. Telephone 4337-4338 Rector

Wanted
Motor Generator Set

One 300-kilowatt motor generator set, 2200-volt, 3-Phase, 60-Cycle. Synchronous Motor and 600-Volt D. C. Generator.

THE HAGERSTOWN & FREDERICK RY. CO.
Frederick, Md.

Keep your Eye
on the
Searchlight
and your
Advertisements in it

CLEVELAND ARMATURE WORKS
Cleveland, Ohio

Everything in the Line of Repairs to Electrical Machinery

Complete Armatures, New Armatures, Rewound Armature Cores, Armature Shafts, Armature Coils, Fields and Commutators.

Established 22 Years.

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.
We positively own these Rails and offer same in carload lots and over.
25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.
Immediate shipment guaranteed and prices very attractive.
Carload and less than carload inquiries and orders solicited.
Rails cut to length for structural purposes.
Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Building, Pittsburgh, Pa.

Equipment for Sale

3—Vertical cross compound Allis **Engines**, each with 3000-kw. A. C. generators direct connected.

4—Allis **Engines**, from 900 to 1500-hp.

4—**Generators**, from 550 to 1550-kw. each.

12—Water-tube **Boilers**, chain grates, condensers, pumps and other engine room and boiler-room auxiliary equipment.

KANSAS CITY RAILWAYS COMPANY
1500 Grand Ave., Kansas City, Mo.

Direct Current Belted Generator

1—500-kw., 550-V., 320 r.p.m., Cp. Wd. Westinghouse 3 bearing direct current generator.

DUQUESNE Electric & Mfg Co.

Bessemer Bldg., Pittsburgh

SEARCHLIGHT SECTION

FOR SALE

Gears and Pinions for Sale

5—62T and 1—69T W. H. 306 Solid Gears;
7—15T and 7—22T W. H. 306 Pinions, all new.
24—62T and 24—69T W. H. 306 Solid Gears;
24—15T and 24—22T W. H. 306 Pinions, used.
Washington and Old Dominion Ry. Co., Washington, D. C. W. B. Smith, S. K.

MISCELLANEOUS WANTS

Wanted to Rent or Purchase

Second-Hand double trucks city or suburban cars for operation on 550/600 volt, direct current. Westinghouse 112-B motors preferred. Give full details. Tide Water Power Company, Wilmington, N. C.

POSITIONS VACANT

ACCOUNTANT—Large traction company desires the services of an accounting man having experience in way and structure and equipment cost accounting. Must be capable of making correct subdivision of expenditures between Capital and Maintenance. In submitting application, state past experience, present occupation, age, and salary desired. All answers treated as confidential. P-138, Elec. Ry. Journal.

BOOKEEPERS—Two men having accounting knowledge, including practical bookkeeping, are desired by large traction interests operating in Eastern New York. Good salaries paid to the right parties. State full experience, personal history, and salary desired in submitting application. All answers considered confidential. P-137, Elec. Ry. Journal.

CAR PAINTER—A first class car painter for several months work. Advise salary desired, when you could report for work and furnish references. Pascagoula St. Ry. & Pwr. Co., Pascagoula, Mississippi.

CAR house foremen wanted, night, two. Good pay to start and excellent opportunity for advancement. Maryland location—Locations vacant operate about 50 cars with G. E. and West. equipment. P-117, Elec. Ry. Journal, Philadelphia.

CHIEF engineer for 15,000 Kw. turbine station in city of 100,000 population located in central west wanted. In making application, state age and give outline of education, experience and salary required. P-142, Elec. Ry. Journal, Chicago.

EXPERIENCED shop and car house electric railway repairman wanted. Good wages ot start with excellent chance for advancemnet. Large Railway Company located Middle East. P-118, Elec. Ry. Journal, Philadelphia.

GRADUATE electrical engineer, having had experience in design, testing and development of the electric equipment of rolling stock wanted. Preferably one familiar with operating difficulties and their solution. Please state all essential details in reply, including salary expected. Excellent opportunity for advancement. P-140, Elec. Ry. Journal, Philadelphia.

GENERAL auditor wanted for Public Service Company near Pittsburgh, Pa., operating street railway and electric properties. Must be thoroughly experienced in public utility work. Initial salary $200 to $250 per month. Apply by mail, stating age, qualifications, with full details regarding experience, present salary and references. P-146, Elec. Ry. Journal, Philadelphia.

Get your Wants into the Searchlight

ADVERTISING RATES

Ads Set in Uniform Style

(Solid, in one paragraph, without display.)

THREE CENTS A WORD, minimum charge 50 cents an insertion, payable in advance, less 10 per cent if one payment is made in advance for four continuous insertions—for advertisements under:

Positions Wanted	Vacation Work Wanted
Evening Work Wanted	Tutoring
	Salesman Wants Connections

FIVE CENTS A WORD, minimum charge $1.50 an insertion, for advertisement under:

Agencies Wanted	Positions Vacant
Agents Wanted	Partner Wanted
Business Opportunities	Representations Wanted
Desk Room for Rent	Salesmen Wanted
Educational	Patents for Sale
Employment Agencies	Plants for Sale
Desk Room Wanted	Sub-Contracts Wanted
Foreign Business	Work Wanted

Miscellaneous for Sale, for Rent or Want Ads.

THIRTY CENTS A LINE, minimum five lines, for all undisplayed advertisements set with a paragraph for each item or tabulated.

THREE DOLLARS AND SIXTY CENTS AN INCH for advertisements for bids (Official Proposals).

Ads Set in Display Type

(Individual space, within border rules.)

Space for these advertisements is sold by the inch. Each page contains 27 inches. The rate per inch is based on the *total* number of inches to be used—that is, the number of inches the advertisement is to occupy multiplied by the number of insertions it is to receive. For instance, a 2-inch advertisement in 2 issues earns the 4-inch rate of $3.90 an inch. A 1-inch space in 4 issues, or a 4-inch space in one issue, also earn the 4-inch rate.

SCHEDULE OF RATES

1 to 3 in., $3.00 an in.	15 to 26 in., $2.70 an in.
4 to 7 in., 2.90 an in.	27 to 49 in., 2.60 an in.
8 to 14 in., 2.80 an in.	50 to 99 in., 2.55 an in

Rates for larger space furnished on request.

INFORMATION

ALLOW FIVE WORDS for the address, if replies are to a box number in care of any of our offices. There is no extra charge for forwarding replies.

IN REPLYING TO ADS. do not enclose original testimonials or anything that you may want returned. State your experience and qualifications in as concise and neat a manner as possible and enclose copies of your testimonials.

BE CAREFUL TO PUT ON ENVELOPE, when answering any "blind," ad, the box number in the ad, the name of the paper, and also the local address of office to which reply is sent:

30th St., at 10th Ave.,	New York
1570 Old Colony Bldg.,	Chicago
657 Leader-News Bldg.,	Cleveland
925 Real Estate Trust Bldg.,	Philadelphia
501 Rin to Bldg.,	San Francisco

WHEN ADVERTISING MACHINERY, use your own name and address—or a local address of some kind—so that the readers can wire direct and get quick replies. We advise also that you state in your advertisement the present location of plant that is offered for sale, or point of delivery provided you are in the market for equipment.

TO SIGN YOUR NAME and address to your advertisement begets the confidence of the reader and facilitate receiving replies. You can, however, obviate delay in receiving answers by signing your ad. only with initials (your own or others), care of your home, your office or a post-office box number in your city.

For quick and satisfactory results tell the reader everything that he will want to know

POSITIONS VACANT

EXPERIENCED car builders and cabinet makers for work on city and interurban cars wanted. New construction and repairs. Steady employment in a town of 15,000 inhabitants in Indiana. P-149, Elec. Ry. Journal, Chicago.

MASTER mechanic for electric railway company located in city of 100,000 population operating 200 miles of city and inter-urban lines, wanted. In making application, give age, outline of education, experience and salary required. P-143, Elec. Ry. Journal, Chicago.

REPAIRMAN wanted—An all around good electric railway car repairman, small road operating four miles of track. Want a man who can do the line work as well as the car repairing. Give experience, references and salary wanted. C. F. Smith, Cheyenne, Wyoming.

SUPERINTENDENT—A small southern road offers $100 per month with excellent opportunities for future advancement to a man that has the combined experience and qualifications for a working car-barn foreman and superintendent of transportation. Tell us all about yourself and why you believe you are the man we want. P-141, Elec. Ry. Journal, Chicago.

EXPERIENCED field supervising engineers wanted. Frame and steel building. Railroad and electrical construction superintendents and foremen.

Immediate applications for above mentioned positions will be considered by a large Contracting Company now organizing for rapid summer building construction project.

Applicants state fully, experience, qualifications, references, salary and how soon available. Address P. O. Box 46, Teledo, Ohio.

There is a Searchlight Section in each of the following papers:

[1] **American Machinist**

[2] **Coal Age**

[3] **Electrical World**

[4] **Electrical Merchandising**

[5] **Electric Railway Journal**

[6] **Engineering and Mining Journal**

[7] **Engineering News-Record**

[8] **Metallurgical and Chemical Engineering**

[9] **Power**

[10] **The Contractor**

Each of these 10 papers is the leading periodical of the industry it serves.

Searchlight advertisements will get you in touch with the important men of these important industries.

SEARCHLIGHT SECTION

POSITIONS WANTED

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APPRAISAL engineer, age 40, technical education and ten years' experience on interurban and street railway construction, power plants, transmission lines, elevated and subway lines. Five years' experience with State Utilities Commission on appraisal of electric railway and light, rate investigations, traffic surveys. Desires position with Public Service Corporation east of St. Louis. References. Minimum salary $250 per month. Address PW-130, Elec. Ry. Journal, Cleveland.

AUDITOR; Solicits change thirteen years' experience Street Railway Accounting. Age 35; married. References. PW-135, Elec. Ry. Journal.

EXECUTIVE of medium sized city and interurban property. Age 35, married, and now employed. Desires position as Manager or Ass't. Manager. Thoroughly familiar with operation and construction of both city and interurban lines. Especially good in handling Public relations and commission hearings. Correspondence confidential. PW-124, Elec. Ry. Journal, Philadelphia.

ENGINEER 31, successful construction, maintenance and electrical experience, at present employed, desires change. Good organizer and can handle men. Highest references. PW-150, Elec. Ry. Journal.

ENGINEER—Age 35, married, experienced as station design and construction, maintenance and operation. Formerly with central station, now with railway company. Best of references. PW-135, Elec. Ry. Journal.

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WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Holden & White, Inc.

Alloys, Steel and Iron. (See also Bearings and Bearing Metals.)
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Ohio Brass Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improv. Co.

Automobiles and Buses.
Brill Co., The J. G.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
National Railway Appliance Co.
St. Louis Car Co.
Standard Steel Works Co.
Taylor Electric Truck Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
American Railway Supply Co.
Electric Service Supplies Co.
International Register Co., The.
Woodman Mfg. & Supply Co., R.

Bankers and Brokers.
Coal & Iron National Bank.

Batteries, Dry.
Johns-Manville Co., H. W.
Nichols-Lintern Co.

Batteries, Storage.
Electric Storage Battery Co.

Bearings and Bearing Metals.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
More-Jones Brass & M. Co.
St. Louis Car Co.
Taylor Elec. Truck Co.
Westinghouse Elec. & M. Co.

Bearings, Center and Roller Side.
Holden & White, Inc.

Bearings, Oil-less, Graphite, Bronze and Wood.
Bound Brook Oil-less Bearing Co.

Bearings, Roller and Ball.
Gurney Ball Bearing Co.
Railway Roller Bearing Co.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail.
Niles-Bement-Pond Co.
Watson-Stillman Co.
Zelnicker Supply Co., W. A.

Blasting Powder and Equipment.
Du Pont de Nemours Co., E. I.

Boiler Cleaning Compounds.
Johns-Manville Co., H. W.

Boiler Coverings.
Johns-Manville Co., H. W.

Boiler Graphite.
Dixon Crucible Co., Joseph.

Boiler Tubes.
National Tube Co.

Boilers.
Babcock & Wilcox Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
Electric Railway Improv. Co.
Imperial Brass Mfg. Co.
Lincoln Bonding Co.
Ohio Brass Co.

Bonding Tools.
American Steel & Wire Co.
Electric Railway Improv. Co.
Electric Service Supplies Co.
Ohio Brass Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improv. Co.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Lincoln Bonding Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Piling and Lumber.)
American Bridge Co.
Bates Expanded Steel Truss Co.
Creaghead Engrg. Co.
Electric Railway Equipment Co.
Electric Service Supplies Co.
Hubbard & Co.
Lindsley Bros. Co.
Ohio Brass Co.

Brake Adjusters.
Holden & White, Inc.
Westinghouse Trac. Brake Co.

Brake Shoes.
American Brake S. & Fdy. Co.
Barbour-Stockwell Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
St. Louis Car Co.
Taylor Elec. Truck Co.
Wheel Truing Brakeshoe Co.

Brakes, Brake Systems and Brake Parts.
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Br. Westinghouse Elec. & Mfg. Co.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
National Brake Co.
St. Louis Car Co.
Safety Car Devices Co.
Taylor Elec. Truck Co.
Westinghouse Trac. Brake Co.

Bridges and Buildings
American Bridge Co.

Brooms, Track, Steel or Rattan.
Zelnicker Supply Co., W. A.

Brushes, Carbon.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
United States Graphite Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
United States Graphite Co.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Eureka Co.

Buckets, Grab
Beaumont Co., R. H.

Bunkers, Coal.
American Bridge Co.
Beaumont Co., R. H.

Bushings, Case Hardened Manganese.
Bemis Car Truck Co.

Bushings, Graphite and Wooden.
Bound Brook Oil-less Bearing Co.

Cables. (See Wires and Cables.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc., see those Headings.)

Car Trimmings. (For Curtains, Doors, Seats, etc., see those Headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Kuhlman Car Co., G. C.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.
Wason Mfg. Co.

Cars, Second Hand.
Electric Equipment Co.

Cars, Self-Propelled.
Br. Westinghouse Elec. & Mfg. Co.
Electric Storage Battery Co.
General Electric Co.

Castings, Brass, Composition or Copper.
Anderson M. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
Horne Mfg. Co.
More-Jones Brass & M. Co.

Castings, Gray Iron and Steel.
American B. S. & Fdry. Co.
American Bridge Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
St. Louis Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
American Brake S. & Fdry. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Electric Service Supplies Co.
Holden & White, Inc.
Horne Mfg. Co.
Ohio Brass Co.
Trolley Supply Co.
Wood Co., C. N.

Ceiling, Car.
Keyes Products Co.
Pantasote Co.

Chain & Belt Machinery
Beaumont Co., R. H.

Checks, Employees.
American Railway Supply Co.

Circuit Breakers.
General Electric Co.
Westinghouse Elec. & M. Co.

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Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

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Ohio Brass Co.

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Railway Improv. Co.

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Coils, Armature and Field.
Cleveland Armature Works.
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D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & Mfg. Co.

Coils, Choke & Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
Electric Service Supplies Co.
International Register Co.

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.
Wood Co., C. N.

Commutator Slotting Files.
Handy Supply Co.

Commutator Stones.
Handy Supply Co.

Commutator Truing Devices.
General Electric Co.

Commutators or Parts.
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Cleveland Armature Works.
Coil Mfg. & Repair Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Mica Insulator Co.
Westinghouse Elec. & M. Co.

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Westinghouse Traction Brake Co.

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Jaeger Machine Co.

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Controller Regulators.
Electric Service Supplies Co.

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Br. Westinghouse Elec. & Mfg. Co.
Columbia M. W. & M. I. Co.
General Electric Co.
Horne Mfg. Co.
Johns-Manville Co., H. W.
Westinghouse Elec. & M. Co.

Controlling Systems.
General Electric Co.
Westinghouse Elec. & M. Co.

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General Electric Co.
Westinghouse Elec. & M. Co.

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Beaumont Co., R. H.
Columbia M. W. & M. I. Co.
Green Eng'g Co.

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Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The.
Roebling's Sons Co., John A.
Samson Cordage Works.
Trolley Supply Co.

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Electric Service Supplies Co.
Samson Cordage Works.
Wood Co., C. N.

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Brill Co., The J. G.
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Van Dorn Coupler Co.
Westinghouse Trac. Brake Co.

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Horne Mfg. Co.

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Crossing Signals. (See Signals, Crossing.)

Crossings, Track. (See Track, Special Work.)

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Doors, Folding Vestibule.
National Pneumatic Co., Inc.

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Ohio Brass Co.

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Electric Service Supplies Co.
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Eyllesby & Co., H. M.
Drum & Co., A. L.
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Jackson, D. C. & Wm. B.
Pugh, S. D.
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Johns-Manville Co., H. W.

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D & W Fuse Co.
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Columbia M. W. & M. I. Co.
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Horne Mfg. Co.

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Electric Service Supplies Co.
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National Ry. Appliance Co.
Nuttall Co., R. D.

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General Electric Co.

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Ohio Brass Co.

Harps, Trolley.
Anderson M. Co., A. & J. M.
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More-Jones Brass & M. Co.
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Trolley Supply Co.

Headlining.
Keyes Products Co.
Pantasote Co., The.

Heaters, Car, Electric.
Consolidated Car Heating Co.
Gold Car Heating & Lighting Co.
Smith Heater Co., Peter.

Heaters, Car, Hot Air and Water.
Cooper Heater Co.
Smith Heater Co., Peter.

Heaters, Car, Stove.
Electric Service Supplies Co.
Smith Heater Co., Peter.

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Horne Mfg. Co.
Johns-Manville Co., H. W.
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Standard Paint Co.
Standard Underground Cable Co.
Standard Woven Fabric Co.
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Westinghouse Elec. & M. Co.

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Electric Service Supplies Co.
General Electric Co.
Horne Mfg. Co.
Johns-Manville Co., H. W.
Mitchell-Rand Mfg. Co.
Okonite Co.
United States Rubber Co.
Westinghouse Elec. & M. Co.

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Anderson M. Co., A. & J. M.
Creaghead Engrg. Co.
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Electric Service Supplies Co.
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General Electric Co.
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Niles-Bement-Pond Co.

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Holden & White, Inc.

Lightning Arresters.
Horne Mfg. C.

Lightning Protection.
Anderson M. Co., A. & J. M.
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Yale & Towne Mfg. Co.

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Galena-Signal Oil Co.

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Lumber. (See Poles, Ties, Posts etc.)

Machine Work.
Columbia M. W. & M. I. Co.
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Columbia M. W. & M. I. Co.
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Watson-Stillman Co.

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Bemis Car Truck Co.

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Meters, Car, Watthour.
Economy Electric Devices Co.

Meters (See Instruments.)

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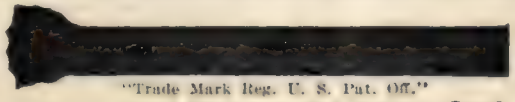
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Westinghouse Trac. Brake Co.

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Watson-Stillman Co.
Westinghouse Trac. Brake Co.

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Electric Service Supplies Co.
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Rubber Ins. Metals Corp.

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Westinghouse Trac. Brake Co.

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Dates Expanded Steel Truss Co.
Electric Railway Equipment Co.
Hubbard & Co.
National Railway Appliance Co.

Pole Sleeves.
Drew Elec. & Mfg. Co.

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Carney & Co., B. J.
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Western Red Cedar Assn.
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Lindsley Bros.

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National Tube Co.
Nuttall Co., R. D.

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Horne Mfg. Co.
International Register Co., The
Wood Co., C. N.
Woodman Mfg. & Supply Co., R.

Punching Machinery.
Watson-Stillman Co.

Purifiers, Feed Water.
Scaife & Sons Co., Wm. B.

Rail Filler Blocks
Alcott, Edward.

Rail Grinders. (See Grinders.)

Rails, Relaying.
Zelnicker Supply Co., W. A.

Rail Welding. (See Welding Processes and Apparatus.)

Rattan.
Brill Co., The J. G.
Electric Service Supplies Co.
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Arthur Power-Saving Recorder Co.

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Bonham Recorder Co.
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Electric Service Supplies Co.
International Register Co., The
Ohmer Fare Register Co.
Rooke Automatic Register Co.

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Peters & Co., G. D.
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Federal Signal Co.
Nachod Signal Co. Inc.
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U. S. Electric Signal Co.
Wood Co., C. N.

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Nuttall Co., R. D.

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Consolidated Car Fender Co.
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Soldering and Brazing Apparatus. (See Welding Proc. & App.)

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Johns-Manville Co., H. W.
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Johns-Manville Co., H. W.
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Barbour-Stockwell Co.
Carnegie Steel Co.
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Columbia M. W. & M. I. Co.
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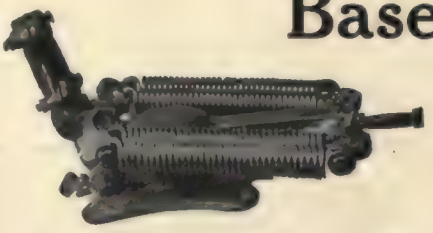
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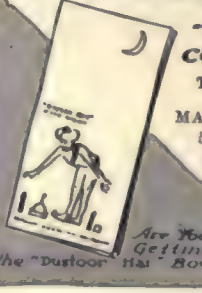
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Roebling's Sons Co., John A.

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Packard Electric Co.
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Westinghouse Elec. & M. Co.

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Specify Titanium-Treated Rails for SAFETY



Post-mortems are unpleasant things—both the post-mortem hearing on some wreck and the post-mortem analysis of the broken rail that caused it.

It's easy enough to see **after the accident** that the fracture was caused by some defect hidden from view in the original rail.

How much better to avoid such consequences from impurities in rail structure by specifying Titanium cleansing treatment.

For $2 per ton, you can be insured both against unforeseen breakage of rails and uneconomical short life of rails.

TITANIUM ALLOY MANUFACTURING COMPANY

Operating Under Rossi Patents — **Processes and Products Patented**

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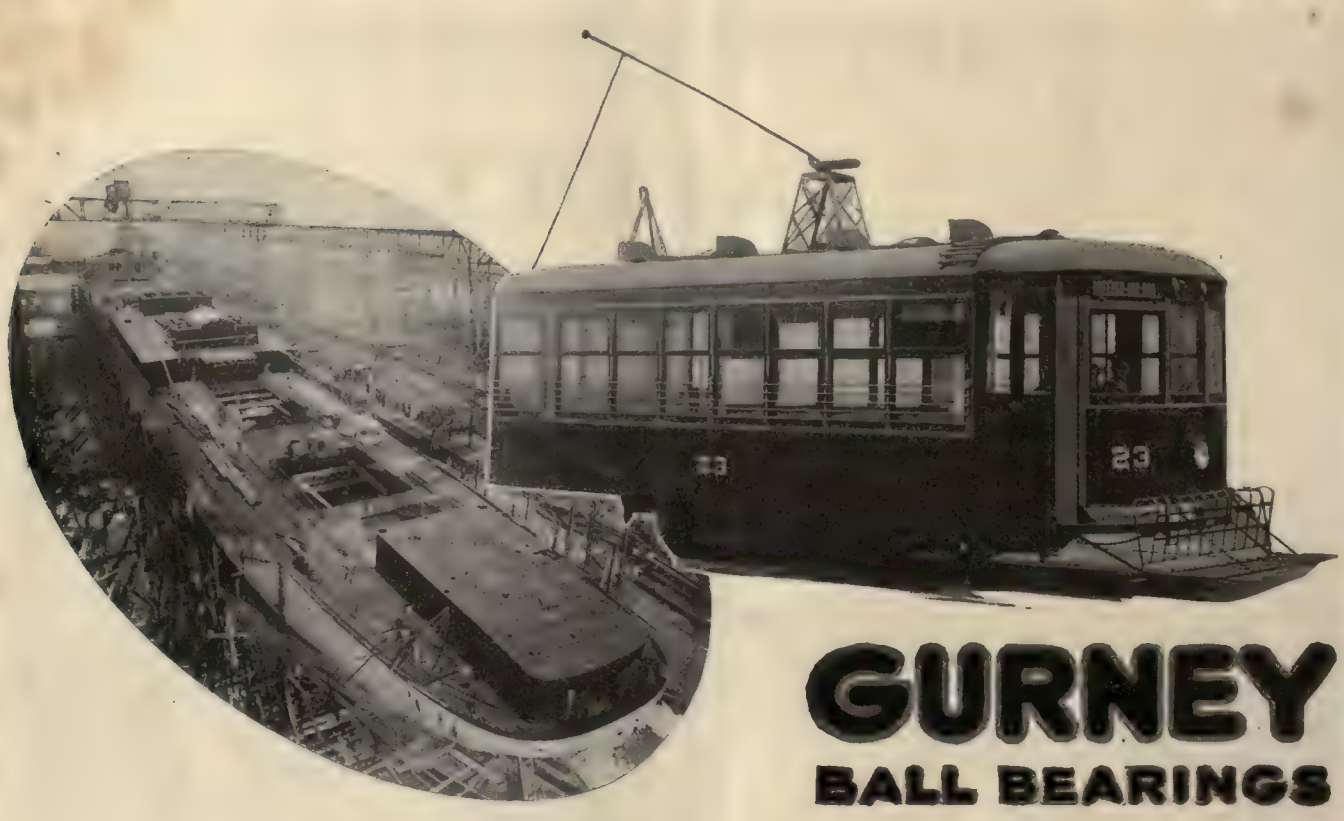
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GURNEY BALL BEARINGS at Everett

ELECTRIC railway car service at the port of Everett, Wash., was never so strenuous as in these days of ships—ships—and more ships. And the cars that are carrying the great crowds of workers are Birney Safety Cars equipped with Gurney Ball Bearings.

Gurney Radio Thrust Bearings are used on the main journals of these cars because of their ability to carry heavy loads and to take the heavy thrust due to rounding curves. Gurney Bearings are also used on the GE-258 motors with which these cars are equipped.

Gurney Ball Bearing Co.
Conrad Patent Licensee
Jamestown, N. Y.

258

GURNEY



Safety, Service and Success

THE buyer of Safety Cars takes no chances. He gets cars that suit the particular operating and service conditions of his lines, whether in a small city, in a farming region, a busy industrial center or a great metropolis. He gets cars that are safest not only from the accident standpoint, but safest from every standpoint of economy, and safest for quick and frequent service. Safety Cars stand for safety, service, stability, standardization, success. Get them and all that goes with them.

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G. C. KUHLMAN CAR CO.
CLEVELAND, OHIO

BRILL

AMERICAN CAR COMPANY
ST. LOUIS, MO.

WASON MANUFACTURING CO.
SPRINGFIELD, MASS.

The K-63 Controller

Less Work for the Motorman—More Room for the Passenger

The K-63 Controller is another marvelous advance in the production of light-weight, compact equipment. Although two of these controllers weigh only 270 pounds, they will handle equipments up to two 40-hp. motors on 600 volts, thus giving a large factor of safety when operating two 25-hp. motors on a light-weight car.

This controller with its light-weight cylinder and smaller fingers is more easily manipulated than the controllers hitherto used on city cars, thus relieving the operator of an appreciable amount of fatigue.

Then, too, the addition to fare handling equipment on the front platform makes compactness exceptionally desirable, thereby securing a high rate of passenger interchange without jostling or possible injury to patrons.

So the K-63 is doubly desirable since its installation will please both the car operator and the car user.

25 3



General Electric Company

General Offices:

Sales Offices

ssing May 11 1918

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Company, Inc.

May 18, 1918

Ball Bearings for Railway Motors

he advantages of SKF Ball Bearings for railway motor armatures have already been recognized by the following railway operators among others:

Pacific Gas & Electric Company
South Covington & Cincinnati Street Railway
Puget Sound International Railway & Power Company
Boston Elevated Railway
Cedar Rapids & Marion City Railway
Tampa Electric Company
Pacific Power & Light Company
Springfield (Ill.) Railway
Stone & Webster
Gray's Harbor Railway & Light Company
Tacoma Railway & Power Company

all of these installations, the SKF Ball Bearing is in Westinghouse 506 Motors. Let us send you data on SKF Ball Bearings for railway motors.

SKF BALL BEARING CO.
HARTFORD, CONN.
398





Detroit United Railway

Traffic demands in Detroit and suburbs, during the past several years, have grown enormously.

This vast and rapid change covers not only the immediate vicinity of Detroit, but reaches far into the up-state territory, to Pontiac and other neighboring cities.

The extensive manufacturing industries of this entire section, create rush periods on the interurban lines similar to those in city service.

Westinghouse No. 557 Motors, and HL Unit Switch Control have recently been placed in service on the Pontiac line, and other divisions, to provide train operation of two, or more, cars.

Westinghouse Electric & Manufacturing Company

East Pittsburgh, Pennsylvania



W
WESTINGHOUSE ELECTRIC

Westinghouse

Vol. 51, No. 20 New York, May 18, 1918 Pages 945 to 998

Electric Railway Journal

H. W. BLAKE, *Editor*

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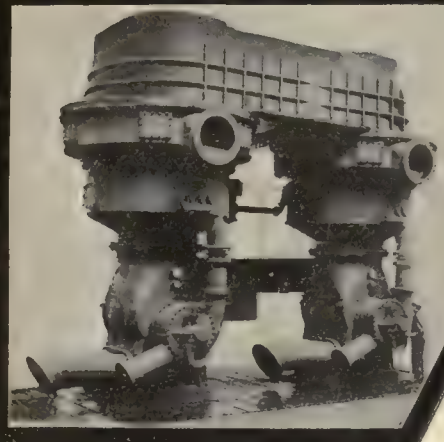
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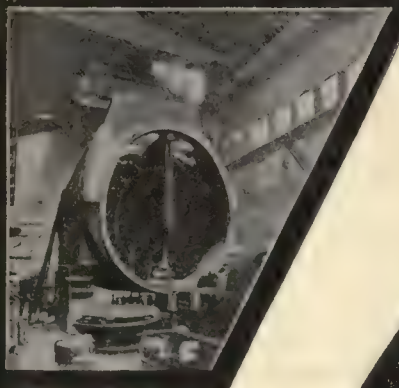
Circulation of this issue 8000 copies.

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The Selection of a Condenser

Always Narrows Down To a Study of—







Surface, Low Level Jet or Barometric Condenser?

Our past experience with the three types of condensers—Surface, Low Level Jet and Barometric—proves that judgment should, in every instance, be based on a thorough investigation of individual plant conditions and requirements.

A preference for or prejudice against one type over others, not resting on sound investigation, will prove the solution to be unsound and the result unsatisfactory.

Westinghouse Electric and Manufacturing Co.
East Pittsburgh, Pa.

Westinghouse

-Individual Plant Conditions

The Greatest Mother in the World



Red Cross contributions, frequent and generous, are our bounden duty. They insure to us here in our comfortable homes a security dearly bought by our soldiers, battered, bruised and bleeding, over there in the battle-torn lines of the World's greatest fight for civilization, home and family. Therefore, we must give, give and give again—give on every call. It's for him and the "Greatest Mother in the World."

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O-B PRODUCTS



O-B Form 1 Trolley Base—Patented



Dark parts are renewable bushings.

Two Big Advantages of O-B Trolley Base

Uniform Pressure

Turning a single set screw adjusts the O-B Trolley Base to hold the wheel to the wire with the pressure which is right for your conditions.

That pressure is maintained with practically no variations at all heights of the wire—always enough to keep wheel on wire without undue strain on base, car roof or line.

Renewable Wearing Parts

Most of the wear is absorbed by steel bushings in the O-B Trolley Base (see illustration).

When it is necessary the bushings are easily, quickly, cheaply renewed. The whole base is made nearly as good as new.

O-B Bases have many other valuable characteristics. They pivot freely. They can carry current far in excess of any service requirements. They are accessible, easy to lubricate, sturdy.

Ask for a trial—at our expense—on your own cars.

THE OHIO BRASS CO., Mansfield, Ohio

New York Philadelphia Pittsburgh Chicago Los Angeles San Francisco





Type W D S
For Both City and Suburban Service

Imperial Incandescent Headlights

Put Every Ray of Light to Work

All of the lamp's light is utilized by Imperial Incandescent Headlights equipped with Crystal Ray Reflectors. These reflectors are clear glass mirrors—ground and polished on both sides—with a corrosion proof backing. They project a clean, sharp, effective beam of light on the track.

Imperial Incandescents of most types can be furnished for Gold Ray (yellow glass mirror—yellow light) or Sterling Ray (metal mirror—clear light) instead of Crystal Ray. The choice is a matter of individual preference.

THE OHIO BRASS COMPANY **Mansfield, Ohio**

New York Philadelphia Pittsburgh Chicago Los Angeles San Francisco

General Sales Agents in U. S. for Crouse-Hinds Imperial Headlights



Phono-Electric

Is Good Service Insurance Anywhere

This ferry terminus of the Broadway line in Brooklyn is not as busy as in the pre-bridge days, but it's far from idle—

Judging from the fact that the Brooklyn Rapid Transit System thought it important enough to insure continuity of service just the same.

So the company put up No. 00 Phono-Electric Trolley Wire in 1909.

And, of course, it's there yet—

Bridgeport Brass Company
Bridgeport Connecticut

2080

"SUMMING UP"

in the Case of

INTERNATIONAL
STEEL TWIN TIES

Standard Wooden Tie Track

Section of track 100 ft. long; 9 ft. wide, with concrete foundation 6 in. under base of tie and concrete between ties.

20	Tie Rods, 2 in. x 5 ft.	at	$0.85	$17.00	
50	Ties, 6 in. x 8 in. x 8 ft. 0 in.	at	0.85	42.50	
100	Tie Plates	at	0.45	45.00	
100	Lbs. Railroad Spikes	at	4.00	4.00	
28.3	Cu.Yds. Concrete	at	5.85	165.56	
34	Cu.Yds. Excavation	at	1.25	42.50	$316.56

International Steel Twin Tie Track

Section of track 100 ft. long, 7 ft. wide with concrete slab 7 in. thick under tie plate, as per The International Steel Tie Company's Drawing No. 135.

16	2/3 Standard Steel Twin Ties	at	$7.00	$116.66	
134	Cast Malleable Clips	at	0.08	10.72	
15.0	Cu.Yds. Concrete	at	5.85	87.75	
15.2	Cu.Yds. Excavation	at	1.25	19.00	$234.13

And the Verdict is:

Saving in Cost Below Base of Rail per 100 feet of track . . . $82.43

Saving Per Mile of Track 4352.30

Additional Item Saved:

Tie rods and tie plates unnecessary.

Welded rail joints minimum cost, and cross bonds are not needed.

Narrow trench means 22% saving in paving and its maintenance.

A labor saving is made by installing one 132-lb. steel twin tie in place of three 130-lb. wooden ties, the simplicity of the fastening and because track gauging is not necessary as tie punching fixes the rail to perfect gauge.

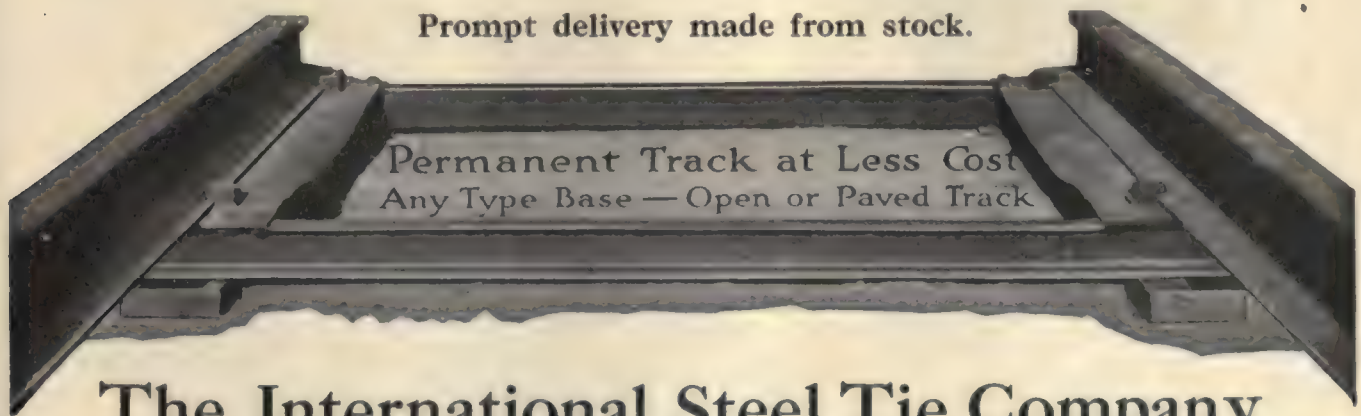
Fifty per cent. labor saving in track construction below base of rail.

Superior form of construction cuts maintenance to a minimum.

All permanent materials produce long life of track.

Concrete foundations with large tie bearing area stays put under the heaviest traffic.

Prompt delivery made from stock.



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Manufacturers of Steel Twin Ties and Crossing Foundations

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A Motion Study in Crew Transportation



Wheel Car Out to Tracks.



Set It on the Rails.



Give It a Gentle Push

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MUDGE
Motor Cars

Are built in a range of types and sizes to meet every requirement of crew or inspection transportation. Numerous exclusive patented features of safety and mechanical perfection identify them.

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465 Railway Exchange, Chicago, Ill.

Detailed information regarding Mudge Motor Cars has been carefully compiled in a handsome illustrated booklet. We will gladly send a copy on request. Tell us your conditions and requirements and let us help with recommendations. We are railroad motor car specialists.



—And You're on Your Way.



"Golden Glow" Headlights Light-up the Way to Hog Island—the Largest Shipyard in the World

The great army of workmen building ships at Hog Island have greatly taxed the cars of the Philadelphia Rapid Transit Co. operating on this branch.

The cars are equipped with powerful "Golden Glow" Headlights, thus permitting high speed and short headway with safety through the intervening rural section.

Their "Golden Glow" Headlights project steady, powerful beams of golden light. These golden beams light up the road-bed 'way ahead, provide an effective warning when approaching grade-crossings and add in many ways to the safety of the thousands of workmen making this trip daily.

The Philadelphia Rapid Transit Co. were quick to realize the importance of "Golden Glow" Headlights on this branch.

You, too, should use "Golden Glow" with their famous reflectors.



ELECTRIC SERVICE SUPPLIES CO.

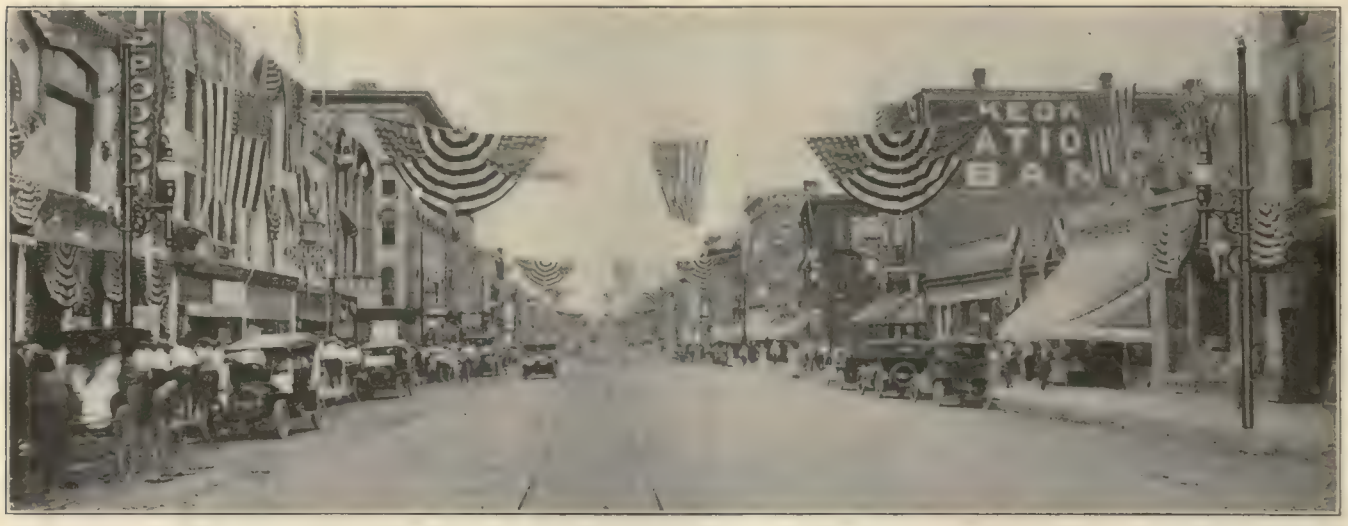
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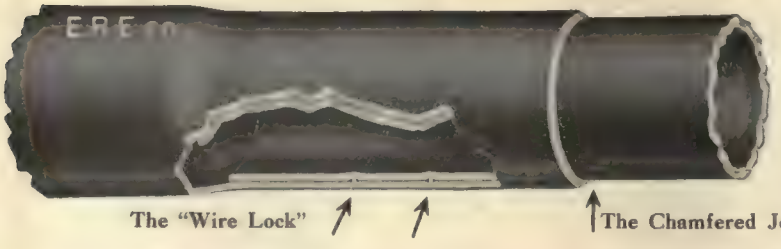
54 Elreco Combination Poles along this Street in Keokuk, Iowa

help business for the merchants—and reduce the overhead troubles of the electric railway.

The cost was not large, for the expense of separate lamp standards was avoided by attaching our Fig. 10154 Brackets directly onto the Elreco Tubular Poles, which are used for supporting the trolley span-wires.

In Keokuk, as in all other cities where it has been adopted, the Elreco tubular street railway pole lines and Elreco street-lighting have proved an unqualified success.

Special Features of Elreco Pole Construction



are the Chamfered Joint and the "Wire Lock" Swedge—one keeps out moisture and prevents weakening due to rust; the other is sure insurance against "telescoping."

Catalogs describing the complete Elreco line for electric railways will be sent at your request.

Elreco Tubular Poles combine lowest cost, lightest weight, least maintenance, greatest adaptability.

ELECTRIC RAILWAY EQUIPMENT CO.

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New York: 30 Church Street

Strong-Straight-Sightly

WESTERN RED CEDAR POLES



Location — Lines of the Gary Street Railway, Gary, Indiana. Alley south of Fifth Avenue, east from Jackson.

45 ft. Western Red Cedar Poles installed in 1908.

Load carried:

3—3 phase 6600 V. Stranded.

3—3 phase 6600 V. No. 2 bare.

4—3 phase 2200 V. 3-0 W.P.

2—3 wire secondary 110 V. single O.W.P.

6—2 wire arc circuits 4500 V. No. 6 W.P.

The value of a pole is largely in its lasting qualities and its strength to carry the overhead load required of it. **Western Red Cedar** has the necessary quality of **Long Life** in the ground and has great strength. In addition to that it has the symmetry which makes the beautiful line. It is lighter and less costly to handle. It can be easily climbed by linemen, and is less dangerous to linemen in all kinds of weather.

Western Red Cedar Association

Spokane, Wash.

RWPO
REILLY'S WOOD PRESERVATIVE OIL
PATENTED

For the Permanent Preservation of Wood

R. W. P. O. is the highest grade oil ever produced for open tank or brush method of treating timbers. It coats the surface of the wood and fills the cells, making them impenetrable to destructive agents.

Its penetrative powers are unexcelled and it will neither evaporate nor dissolve.

R. W. P. O. is limpid and free flowing at working temperatures. It outlasts the life of the timber and is the most economical preservative known for wood.

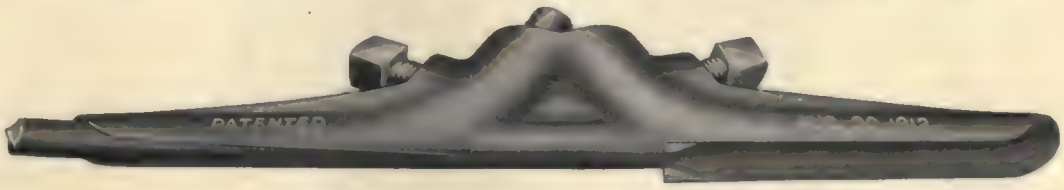
Republic Creosoting Company

Indianapolis, Indiana

Plants: Indianapolis Minneapolis Seattle Mobile Norfolk

LINE MATERIAL ECONOMY

SMOOTH RUNNING SAMSONS



Drew Clinch Ears are all one-piece castings, with deep groove, made to A.E.R.A. specifications as to composition, that is, 84% copper, 10% zinc, 3% tin, 3% lead.

Unless specially ordered no milling is done, inside or out of the groove, so that the gripping power of the hard grainy, dense exterior portion of the casting is retained, preventing "slippage" and offering greater resistance to wheel-wear.

The concave sides of the boss eliminate wheel bumping on straight line or curve without sacrificing strength. The ends are built up heavier, which prevents them from being pushed up from the wire in service, and yet the design of the ear provides a sufficient flexibility to prevent annealing of the wire by wheel passage.

The long life of Drew Ears has proved to be a pronounced saving in yearly maintenance cost on many properties. Is your road one of these? If not, ask for further proof and sample.

DREW CLINCH EARS



The Samson Splicer is installed without special tools, stays upright in the line, does not make a hard spot, and is non-arcing.

This splicer has met every requirement of a large number of the most critical line superintendents in the United States.

It is of liberal proportions throughout, the design being such as to make a sturdy splicer and yet not adding undue weight to the line.

The set screws are placed at a slight angle so that the stresses in the splice are evenly balanced and the trolley held firmly.

The Samson Splicer has strength in excess of new wire, and after years of service is still smooth running.

Catalogue 18 sent on request

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The Mark of Quality

DREW ELECTRIC & MFG. COMPANY

Offices and Works:

1016 E. Michigan St., Indianapolis, Ind.

DREW

The Mark of Quality

Around the Continent With Hale and Kilburn



At Richmond on Center-Entrance Cars

The fine center-entrance cars used in city and suburban service at Richmond, by the Virginia Railway and Power Company, are justly admired for their handsome outlines and comfortable interiors. It is hardly surprising, therefore, to find that Hale and Kilburn seats are in all of these cars—and that they have proved well adapted to the up-hill and down-dale speeds and service in this city, famous for both its hills and its history!

Hale and Kilburn Progress in Car Seating Never Stops

No matter how satisfied our customers are, we continually strive to improve, as witness the No. 400 seat which is destined to become the standard reversible car seat of America's electric railways. We shall be glad to give you full particulars any time.

WALKOVER

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ERICO
THE LINE OF LEAST RESISTANCE



Schedules Are Maintained

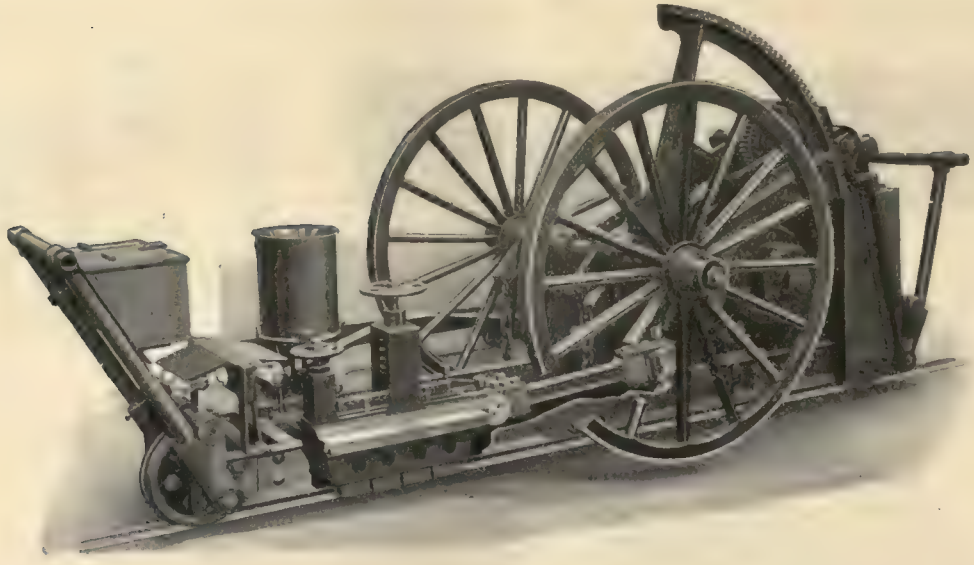
despite the fact that an *Erico Welder* is at work on these rails. At the approach of a car the Welder is simply lifted off the rails and the car passes by without even slackening its speed.

The Erico Portable Welding Outfit is gaining in value every day, as labor shortage becomes more evident.

Full information on request.

The Electric Railway Improvement Co.

Cleveland, Ohio



It Saves Money in BIG Sums

The electric railway companies which have been using the

Reciprocating Track Grinder

and have definitely figured the results achieved are keenly appreciative of the fact that the savings due to this machine are *big* savings. That the savings made represent not merely an adequate return on the investment, but that they quickly repay the investment and roll up a net profit of comfortable proportions.

These quick and large savings have been especially apparent where properties have had sections of track deteriorate to such an extent that entirely new track seemed to be the only remedy.

In many such cases the Reciprocating Grinder has made the old track serviceable for years at a *fraction* of the cost of new track.

The Reciprocating Track Grinder has saved a *lot of money* for the electric railway industry.

It will save money on your lines if you give it the chance.

RAILWAY TRACK-WORK COMPANY

30th and Walnut Streets, Philadelphia

AGENTS: Holden & White, Inc., 343 S. Dearborn St., Chicago. Wigmore, Hall & Co., Pacific Electric Bldg., Los Angeles, Cal.

Electric Welding Economy

You are interested in saving. Now-a-days everybody is—or should be.

Electric *Welding* is the most economical because it saves labor—which means time—and money.

Electric Welding is essential in electric railway work—in the shop—on the track. It is in general use.

Our Universal Welding Equipments

are the most conomical

This is a demonstrated fact—it is portable—it is light—it can be handled by one man—it uses less current—it is the most effective.

Its primary use is for rail joint welding. But it is equally effective and convenient for any kind of welding and repair work in the shops or on the road.

Write for full particulars

AWC Trade Mark.

ATLANTIC WELDING COMPANY
30 CHURCH STREET
NEW YORK

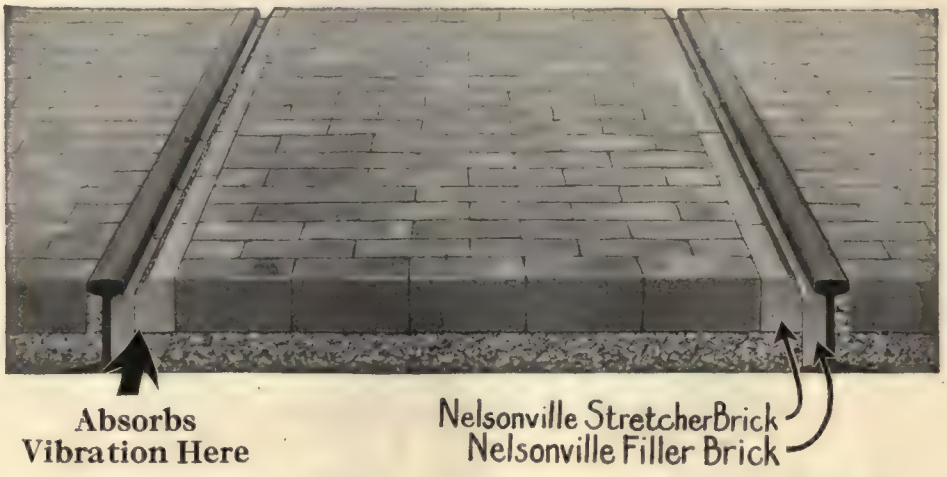
AWC Trade Mark.

CHAS. N. WOOD CO.
14 Federal Street, Boston, Mass.
RAILWAY TRACK-WORK CO.
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The ELEC. ENGINEERING & MFG. CO
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343 S. Dearborn St., Chicago, Ill.

Canadian Representatives:
LYMAN TUBE & SUPPLY CO., Ltd.
Montreal Toronto
Winnipeg

NO "Kick-ups" are possible



with Nelsonville Brick



Girder rail is heavier, more expensive, and less satisfactory in wearing qualities than T-rail.

The great trouble with T-rails in street pavements has been the tendency of the blocks between the T-rails to "kick-up."

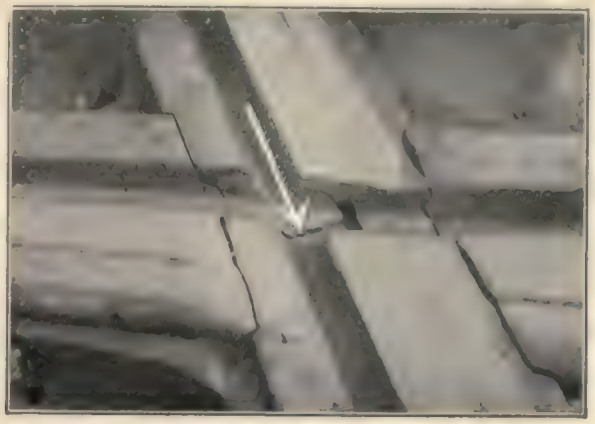
The insertion of Nelsonville Stretcher and Filler Bricks, as shown in the picture above, does away with "kick-up" dangers by absorbing all vibration.

This means that the old reliable, economical T-rail can be used in street car tracks to good advantage.

Get Our Literature Today

THE NELSONVILLE BRICK CO.

Nelsonville, Ohio



Main filling or backbone of rolled rail crossing broken at flangeway intersection

Rolled Rail Crossings

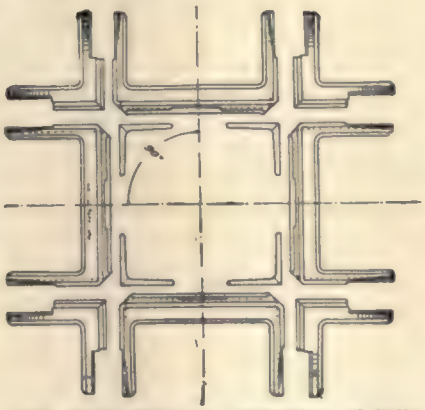
develop frequent fractures at the point shown in the picture to the left. Such breaks are unavoidable because of the lack of flexibility at the flangeway intersections.

Experience has demonstrated that rolled rail wears out in less than one-quarter the time of cast manganese.

As a result these crossings have to be replaced frequently so that their apparent lower first cost, when compared with that of articulated cast manganese crossings, is deceptive.

Balkwill Articulated Cast Manganese Crossings

have scientifically designed joints at the places where breakage formerly occurred. It takes several rolled rail crossings to equal the life of but *one* Balkwill Articulated Cast Manganese Crossing. Therefore the Balkwill Crossing is the cheapest in the long run.



Joints at the flangeway intersections of Balkwill Articulated Cast Manganese Crossings positively eliminate breakage

It saves interruption to traffic, makes less demand on labor, which is now so scarce, and also reduces the cost of making replacements frequently.

In other words, it gives you



Joints in Balkwill Articulated Cast Manganese Crossings are life savers. They positively prevent breakage at flangeway intersections, permitting 100% wear before renewal is necessary

MORE WEAR PER DOLLAR THAN ANY OTHER CROSSING YOU CAN BUY

Order Balkwill Articulated Cast Manganese Crossings Direct from Your Special Work Manufacturers

Write us for detail information and list of installations. Don't accept a substitute as there is none.

The Balkwill Manganese Crossing Co.

506 Williamson Building, Cleveland, Ohio

Abbott Rail-Joint Plates

make joints the strongest part of the track

AS an independent part, the Abbott Plate can be *and is* made harder, stronger and more elastic than the splice bars.

A slight camber, at its center, together with the high resilience of the axle steel we use, brings the rail ends to bear first, until as the wheel load approaches, the plate depresses into a full flat bearing with the rail bases and gives them the solid support of the two joint ties.

The strength and efficiency of this plate must be evident from the pictures. The combination of reversed flanging with 3-inch vertical depth of metal under the rail ends provides for internal stresses and brings the wheel load upon the joint ties in the same manner as the load on a short deck bridge is distributed upon its piers.

Service records demonstrate that Abbott Joint Plates will repay the cost of their installation during the first year by the saving in maintenance labor, at the same time make smooth running track surface, prevent the rail ends from battering, splice bars from bending or wearing, bolts from stretching; also will act as anti-creepers, and rail end guides, affording temporary protection where splice bars become loose.

Ask for our booklet
"Improved Track Appliances." 288



The ABBOTT RAIL JOINT PLATE
"BUILT LIKE A BRIDGE"



Lackawanna Steel Company
LACKAWANNA, N. Y.

ATLANTA CHICAGO DETROIT ST. LOUIS
BOSTON CINCINNATI NEW YORK SAN FRANCISCO
BUFFALO CLEVELAND PHILADELPHIA HAVANA

LAST winter the cry was coal. How about next winter?

Dr. Garfield says, "If public utilities and industrial plants have not sufficient coal storage space they should at once provide it."

The most important thing about this, other than the warning to provide sufficient storage space, is the fact that you should do so *at once.*

We are solving 50 problems such as yours each month and can handle some more, *but it takes time* to deliver materials and finish the construction even after the plans are made and O.K.'d.

So don't wait until mid-summer or fall before you act.

We do more than merely sell coal and ash handling machinery—we design and erect the complete equipment. We study your special requirements; plan new layouts or remodel old ones and send expert erectors to install the job ready to operate. One contract and one guarantee covers everything—no inexperienced contractors and no divided responsibility.

Send sketches of your boiler room layout—we'll tell you what can be done and how much it will cost.

You ought to know more about our service, as described in Catalog 33.

R. H. BEAUMONT COMPANY

111 South Fifth Street, Philadelphia, Pa.

New York: 50 Church St. **Boston: 141 Milk St.**

Specialists for 25 years in complete equipment for handling coal, ashes and coke in boiler and gas houses.

Beaumont

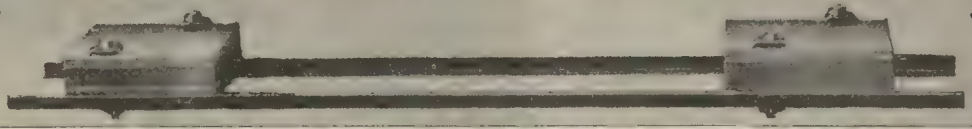
ONE CONTRACT
ONE RESPONSIBILITY

Remember Last Winter and act NOW

Sometimes we can save our customers much expense in simple ways. The New York & Pennsylvania Paper Co., Willsboro, N. Y. were located on a hillside. By our advice they located the power house below nearby railroad tracks, with one wall forming part of a large storage-bin holding 3,000 tons. Thus coal goes directly by gravity from cars to boiler house. A traveling weigh larry takes it from openings in the wall and delivers in front of boilers. Ashes are taken in push cars and dumped to railroad cars at a lower level. We furnished the larry, etc., and built the retaining wall and boiler house. See photos below.



The MECHANICAL RAILWAY TIE



Here is a Demonstration

The mechanical tie shown in this illustration was modeled in concrete for open track use.



It was placed in the tracks of the Dayton, Springfield & Xenia Southern Railway at a point where it would be subjected to the most severe use. Heavy cars at high speed have hammered this tie for **Six Years.** Its condition shows plainly—it's as good as when it was installed.



The 6-in. steel I-beam, shown here, has been in use for **Five Years** under a cross-over near a railroad crossing, where all cars run at reduced speed. It is merely **one** of a number similarly dented and hammered.

Just Study the Pictures

Then write us for further details.

THE DAYTON MECHANICAL TIE CO.

201 Third Street Arcade

DAYTON, OHIO



National Pneumatic Door and Step Control

Aid Better Service for Syracuse

Another twenty-five Peter Witt front entrance, center-exit cars have gone to the Syracuse Lines, New York State Railways.

And as on the first order of thirty-five for Syracuse and Utica, *National Pneumatic* Door Engines are standard—

Because they have made good in promoting that rapid interchange of passengers so characteristic of this pay-as-you-pass design.

NATIONAL PNEUMATIC COMPANY INC.

50 Church St. New York

515 Laflin St. Chicago

How Much is Really Scrap?

How much of that pile of cracked axle caps, worn pinions, broken resistance grids, defective drop forgings, and discarded equipment is REALLY scrap?

How many short ends of costly high speed steel machine tools are lying around in your repair shop because they "can't be used"? Probably 90% of your scrap **could** be used—if you had a

Lincoln Arc Welder

SCRAP RECLAMATION.

It has not been so long ago since most plant managers, superintendents, and owners regarded anything thrown into the scrap-pile as waste, beyond reclamation.

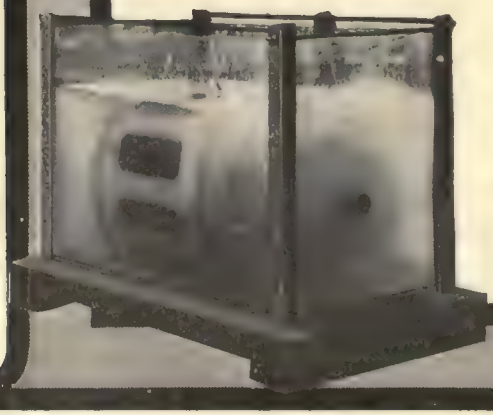
Probably two things have contributed more than anything else to change their opinions of waste—war and modern welding processes.

In ordinary times the scrap-pile is a neglected avenue for the escape of profits. Now that war has pushed up the prices of raw material to dizzy heights, the American plant owner and factory man have begun to analyze their scrap heaps. Usually they find huge accumulations of damaged or worn machinery tools, "short ends" and other material that represents considerable profit thrown away. Face to face with labor shortage, metal shortage and the time factor plant owners are reclaiming these worn and damaged machines and broken tools and putting them back to work earning profits.

From "The Welding Engineer"

The usefulness of the LINCOLN ARC WELDER does not end there by any means. It will open up new possibilities in track maintenance operations, by repairing perfectly all cupped and corrugated rails, worn cross-overs and damaged points. A year hence you'll wonder how you ever did without it.

Write for our Bulletin No. 104-J on Arc Welding.



The Lincoln Electric Co.

Cleveland, Ohio

New York City	Columbus	Philadelphia
Buffalo	Detroit	Charlotte, N. C.
Syracuse	Pittsburgh	Toronto
Boston	Minneapolis	Montreal
Chicago		

Agencies in other principal cities

AN OPEN FACE DEVICE

The motorman sees what he saves!

BECAUSE—



"The Watchdog of Your Power"

the ECONOMY Meter is an Open-Face Device— its Readings Show Both the Management and the Motorman What Progress He is Making

There is no mystery about the ECONOMY Meter method of saving energy. The device is **open face.** The figures are there in plain sight, as simple and as readable as the figures on a cyclometer.

This is getting to the very fundamentals of energy checking and saving—a direct reading of the propulsion power actually consumed.

The ECONOMY Meter actually measures what the motorman is trying to save. He sees his own records at any time. He learns HOW to save energy, by proper acceleration, proper coasting and proper braking and he **observes** his progress.

There's nothing like showing him in actual figures the precise effect of indifferent handling of controller and brake.

The open-face feature, furthermore, **appeals** to the motorman. He "writes his own power bills," and he constantly strives for a record, or at least to better his previous performance. The reminder that he is being rated is salutary in itself.

In addition to the above advantages, ECONOMY Meters will produce data of great value to the engineering department, assisting it in choice and maintenance of equipment. It will also yield information which will be valuable to the transportation department in taking slack out of schedules.

The matter of initial investment is of prime importance. We invite your consideration of this feature particularly, in connection with our device.



L. E. Gould, Pres.

N-L Battery Taillights



The fact of the matter is you know yourself what an expensive item an oil taillight is, and how your trainmen detest them.

The N-L Battery Taillight performs all the functions of an oil taillight and does it better.

Examine the diagram below and see how simple your means of illumination of taillights can be made. How much more agreeable to your trainmen.

MORE DEPENDABLE (and that is the big point) REQUIRES LESS THAN ONE-TENTH THE LABOR, IS FROM 50% TO 100% LESS COSTLY.

The *Battery Lamps* will last indefinitely, as their actual service is for very short periods. The *Relay* is substantial and reliable. The *Battery* requires no attention or repairs.

You cannot afford to use oil taillights.

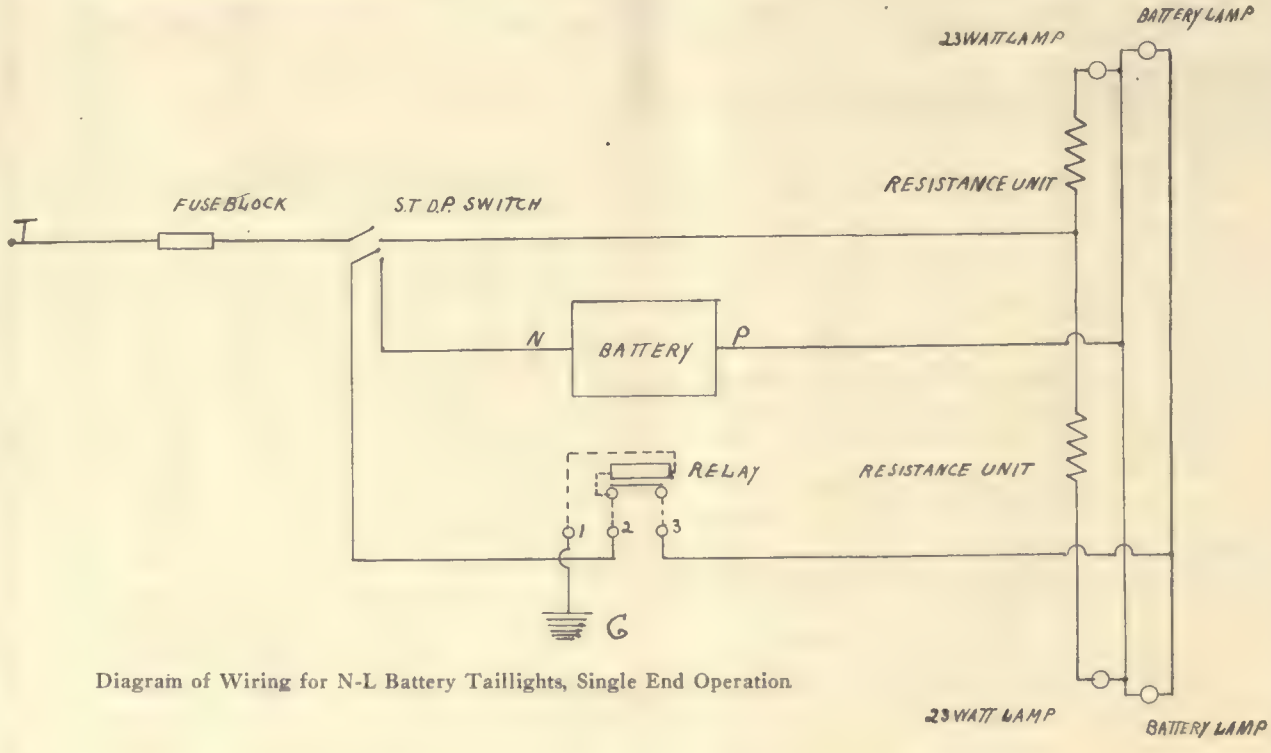


Diagram of Wiring for N-L Battery Taillights, Single End Operation

THE NICHOLS-LINTERN COMPANY

CLEVELAND, OHIO, U. S. A.

DURADUCT



The Perfect Non-Metallic Conduit on Safety Cars at Tacoma, Wash.

The new Stone & Webster Safety Cars for Tacoma, Washington are wired in DURADUCT.

This adds another Stone & Webster property to the users of DURADUCT light-weight car wiring conduit.

In fact, Duraduct is traveling hand in hand with the Safety Car, because both are making good.

To know DURADUCT is to use it.

TUBULAR WOVEN FABRIC COMPANY
MANUFACTURERS —— PAWTUCKET, R. I.
GENERAL SALES AGENT — A HALL BERRY
71-73 Murray St., New York 9 So. Clinton St., Chicago

Northern Electric Company LIMITED Distributors for Canada

A Great Saving in Power



This recorder has shown in its service on more than 1200 cars that it can help to produce tremendous savings in consumption of energy.

The Arthur Power-Saving Recorder

is now being marketed with an additional feature which insures even greater savings.



This Added Feature

possesses the important advantage of checking the motorman's operation of

the controller

while retaining all the values which come from checking his operation of

the brakes

Requires no live wires—no fuses—no shunts—no resistances—no switches.

Do you see the enormous possibilities which this presents in educating your car crews to the best methods of safe operation and minimum consumption of power?

Write us for detailed information

The Arthur Power-Saving Recorder Co.

Second National Bank Building, New Haven, Conn.



Little more than fishing was done along the Communipaw Shore (Jersey City) before the transatlantic steamships picked that side of the Hudson for their western landing places. Certainly it is difficult to realize that the scene of this old picture is very close to the Jersey City terminal of

The Hudson Tubes

After this great engineering work was completed in 1908-1909, electric rapid transit took the place of the ferry boat traffic from the New Jersey shores to Lower Manhattan. A year later the up-town branch was opened and a large proportion of the shopping trade was handled by the Tubes at 33d Street and Broadway. Shortly afterwards the tunnel system was carried further inland on the Jersey side and it now has its terminal at Newark, where it taps the great industrial center of the Mosquito State.

In the development of this important rapid transit system, with its heavy high-speed trains under particularly difficult operating conditions, lubrication methods had to be provided to meet the new conditions.

Galena Oils *and* Galena Service

have been evolved with this point in view—to give the very best possible lubricant to meet special traffic or maintenance conditions. If there should arise, in your own property, a problem of lubrication which offers puzzling difficulties, consult us. The chances are we have met and solved the same problem, or one very like it, for some other road.

Galena-Signal Oil Co.

Franklin, Pa.

The V-K Oilless Trolley Wheel and V-K Non-Arcing Harp have an unbroken record for consistently reliable service. It is not a question of experiment with the V-K.

The wheel is self-lubricating. Provides the highest conductivity and when used with the V-K Non-Arcing Harp we guarantee it will outlast any other type of wheel.

The locking device on the harp prevents wear on pins and sockets —checks arcing,—increases the mileage from any wheel by improving current flow.

These are points all to be well considered in the purchase of trolley equipment.

May we send a catalog?

MORE-JONES
BRASS & METAL CO.
St. Louis, Mo., U. S. A.

V-K





Under Crowded City Conditions

it is just as easy to secure a large percentage of no-power or COASTING Time with a *Rico Coasting Recorder* as it is on clear track—

Rico Coasting Recorder



simply by coasting down to the standing car ahead instead of cutting off power so late that it becomes necessary to jam on the brakes at the last second.

Time is the Essence of Railroading

RAILWAY IMPROVEMENT CO. RICO 61 BROADWAY, NEW YORK

For Your Inspection

The Form J-2 Ear

The machined fit of the J-2 Ear bears snugly against every side of the trolley wire. This kind of contact gives the greatest amount of holding power possible in a clinch ear.

The lips are also machined to thickness.

G-E Standard Alloy Ears will give you the kind of service that counts.

Stock shipments in any reasonable quantity.



General Electric Company

General Office: Schenectady, N. Y.

Sales Offices in All Large Cities

7574

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 New York, Saturday, May 18, 1918 *Number 20*

Are You Making the Best Possible Use of These Special Monthly Issues?

FOR several months now one issue of this paper in each month has been devoted especially to the shop, track, line and power departments. In planning these issues we invited several specialists to furnish each a series of articles dealing with the fundamentals of the technical departments of the electric railway. Each issue now consists of two technical divisions, one dealing with the general principles and the other illustrating from all departments in all parts of the country the application of these principles in every-day work.

It has undoubtedly occurred to many readers of these special issues that they have in their hands an unparalleled educational opportunity. If they were paying a correspondence school a large fee for this material they would appreciate it still more. There is a comprehensive plan underlying both the longer articles and the shorter ones which is already apparent through careful reading of the articles. This plan should work in well with the ambitions of young men for the best available information in their several lines, and it should be used by men in responsible positions in training the younger men under them. The articles could be readily made the basis of regular study, their topics could be discussed at company section and shop meetings, or quizzes could be held upon them from time to time with the voluntary attendance of the more ambitious youngsters, etc.

The writers of the articles are making considerable sacrifice of time and energy for the benefit of the industry. This will not have been in vain if the industry is making the best possible use of the fruits of their thought and experience.

Standardization in General and on Track Spirals in Particular

ALMOST interesting and instructive discussion was started by E. M. T. Ryder in an article in the issue for April 6 on the standardization of track spirals. In all of this there has been apparent a hope that ultimately the condition of standardization may be approximated, for only thus will it be possible to reduce materially the number of spirals now in use. It would appear that there are more obstacles in the way of standardizing track spirals than in standardizing other elements of electric railway equipment, if that is possible. Those who have discussed the matter appear to feel that however desirable ultimate standardization may be it can only be brought about gradually.

Starting with the assumption then that ultimate standardization is desirable and not impossible, two inevitable facts must be faced. First, there must be visualized somehow a picture of the standards towards which progress is desirable. In the second place steps must be taken successively and consistently in the direction of the desired goal. No one will deny that immediate standardization of track spirals or anything else is impracticable. Even if all way engineers could agree on what they would like to have it would take time to enable them to get it. Mr. Ryder, after painstaking analysis, has outlined what he considers to be the ideal toward which to work. Mr. Angerer thinks that a less elaborate system would be better. It seems to us to be up to the American Electric Railway Engineering Association, and initially to its commitee on way matters, to take all of this material now available and set up some kind of a group of standards towards which progress may be directed. It is true that committee work is now in abeyance, but it must in time be resumed, and when it is resumed it might well take up this matter of track spirals.

On principle, standardization is right. It conduces to economy, and if sufficiently flexible it need not involve stagnation. There are difficulties in the way of bringing it about, but the very effort to establish a standard is stimulating and has tangible engineering value. To repeat, standardization without stagnation is the desideratum.

Demands for Higher Fares Come From All Sides

RECENT developments throughout the country would seem to indicate that organized labor is beginning to see the light on the question of increased revenues for electric railways. This applies at least to that portion of the working classes who owe their daily bread to utilities of this kind. While this may suggest a selfish motive, the point probably is the stronger because these employees have at last come to realize that existing rates of fare will not cover increasing operating costs, including the larger wages which they are seeking.

For some years past, one of the strongest arguments of dissatisfied trainmen in arbitration proceedings has been the very evident increased cost of living. They may have overlooked the fact that the employing companies also had to exist under conditions where mounting costs of supplies met them on all sides. Labor began to take a broader view of the situation when some settlements were made on the promise from the companies of higher wages when the added burden could be afforded.

Within the past few weeks the employees of the New York Railways Company received encouragement from the chairman of the Public Service Commission when

they urged franchise modifications which would permit higher fares. In St. Louis organized labor joined in the appeal to the State commission for increased revenues for the employing company. And now comes one of the official organs of the Amalgamated Association which asks editorially: "Where it can be honestly shown that increased fare rates are necessary to meet operating costs, why should they be denied? Why should a traction company be forced to carry passengers at a loss?"

And so the tide of public sentiment mounts higher and becomes more forceful. The people are coming to appreciate that they must have service at any cost, because without service industry of all kinds will suffer. The higher wage inducement in other occupations is having its effect, and if the people want transportation facilities they must be willing to pay the price which will enable the companies to hold their present forces and maintain or add to existing equipment. The public authorities who are called upon to act in cases of this kind must indeed be blind and deaf if they cannot see and hear the evidence which is so overwhelming.

The Essential Nature of the Electric Railway Business

THE greatest thing about the electric railway business is that, in common with other primary forms of transportation, it is essential to the welfare and the development of the country. This characteristic of essentiality makes the business a fascinating one and holds thousands of capable men in it even through times of stress and of rival attractions in other lines. At the moment the public demands more in the way of electric railway transportation than it seems willing to pay for. This, however, is a transient condition which ultimately will redound to the benefit of the industry. It will do so for at least two reasons: First, the general educational effect of the railway pressure for increased fares will be ultimately to make the public reasonable. Furthermore, the reflex influence on the railways themselves will be in the direction of improved service with the best procurable operating economies.

In his recent company section address on "Our Job," abstracted in the issue of this paper for May 4, N. W. Bolen raised and answered the question as to why men remain in electric railway work under the present strenuous conditions. His only answer to this was that to the men fitted for the work it makes an irresistible appeal. If one is "called" to this work he will stay by it through thick and thin. If he has at any time a tendency to feel a little blue all that is necessary is a freshening of the conviction that his work is worth while because it furnishes something which the people cannot do without.

What is true with regard to the operating side of the business is equally true of the manufacturing side. Railway men cannot give good service without good equipment. Cars are needed and will continue to be needed, fitted with modern motors, controllers, brakes and all sorts of economical and convenient devices. These cars must roll on rails supported on modern ties, and they will require power which must be produced cheaply and transmitted economically. Reliable signals must make possible the safe and speedy operation of these cars. To be sure, the railways are not buying maintenance supplies as they would in normal times and few extensions are being made. But even now in the aggregate the business is a tremendous one, and when the railways again come into their own, as they must do in the reasonably near future, the wear and tear of these "off" years will be made good and the arrested growth will be compensated for by well considered expansion.

A Well-Deserved Honor for the Rhode Island Company

SOME weeks ago the ELECTRIC RAILWAY JOURNAL offered a silver cup to the company section of the American Electric Railway Association which should be organized with a charter membership larger than that of the Rhode Island Company section. This was done by way of seconding the challenge of that section to electric railway companies generally to exceed its achievement of organizing with 216 members. In making its offer the JOURNAL did not have in mind the award of the cup to the Rhode Island Company section itself, but further consideration made it seem eminently fitting that this company should have the cup and hold it until the challenge had been met. The cup has therefore been purchased and a picture of it appears on the "Association News" page in this issue. It has been accepted by the association, under whose auspices it will be fittingly awarded at an early date.

There are now twelve company sections in the association, all, we believe, accomplishing a worthy purpose and forming an admirable connecting link between managers and men. While few in numbers these sections represent a very much larger fraction of the total mileage and rolling stock than the number and membership would indicate. Through the wide publicity given to their proceedings they are exerting a powerful influence throughout the industry. As has been pointed out in these columns before, these sections are needed now if they ever were, which is to say that they are needed now very much indeed. The publishers of this paper hope that the cup will serve at least to focus attention, from time to time, upon the duty which devolves upon those companies which can do so to form company sections in their ranks. It will at least provide an impulse for starting new sections off with the greatest possible accelerating force.

In this connection it is interesting to note the charter memberships of the earlier formed sections. From association headquarters we learn that grouped according to number of charter members these were as follows: Public Service Railway 156; Cumberland County Power & Light Company 145; Chicago Elevated Railroads and The Connecticut Company 138 each; Toledo Railways & Light Company 120; Capital Traction Company 78; Newport News & Hampton Railway, Gas & Electric Company 60; Washington Railway & Electric Company 53; Milwaukee Electric Railway & Light Company 48; Denver Tramway 32; and Manila Electric Railway & Light Company 18. These data show what a remarkable start the Rhode Island Company section has had, but the present memberships of several of the sections prove that it ought to be possible to do even better yet.

Automatic Operation as a War Measure

THE use of automatic devices in car equipment has received increased attention during the past year. Such equipment may be properly considered as war necessities since it is aiding electric railways to solve their labor problems at this time of great demand for experienced men. As motormen, conductors and other railway employees enlist or are called to their country's service, others must do their work. Experienced men are hard to find and it takes time to develop new men so that they may become efficient car operators. Manifestly, the simpler the operating devices are, the quicker the men can be made experts. This is war work. Many of the men have gone. Others are needed to replace them. Their jobs should be made as pleasant as possible so they will be filled with enthusiasm for their work.

There is still another problem coming—one we do not like to think of. Soon some of the brave lads will be returning to us with an arm or a leg gone or some other defect resulting from their service. We would be glad to see them at their former work again. A real field for automatic appliances in car operation is thus opened up for the use of men who have been physically incapacitated from the war. For this work, we want all the improvements possible injected into car operation and we want the idealists and the progressives to help to the limit of their resources in developing such devices.

Why Shopmen Leave Electric Railway Service

NINE times out of ten the man who throws up his job gives as his unanswerable reason the laconic reply: "To get more money." Perhaps this little story from life will bring out one reason why the railway shopman, not only in these times but always, is so willing to move.

An engineer accustomed to checking railway payrolls was requested to check some labor force accounts for an electric contracting firm. Conceive his astonishment when he found that 75 cents per hour was being paid for wiremen whereas he knew that railways paid 30 to 40 cents for the same work.

His first thought was that the work must have included overtime or was of special character for which the men were allowed double time. But this was not so—it was straight time and at regular rates of pay. Can you blame the railway shopman for "leaving home"? Railways are not getting many young technically trained men at present, either. Where do such men go? They may be found in the big manufacturing plants, and they "fight shy" of electric railway properties.

Superintendents of equipment are not to blame for the deplorable labor situation in their departments. They know the way out but unfortunately are rarely supplied with data that would enable them to prove definitely that the traffic losses due to poor maintenance labor are big enough to justify the payment of the prevailing rate of wages at least. When shopmen are rated properly and are paid for their ability to prevent accidents and delays in service, then and only then will they "stay at home."

"Nothing Is Ever Settled Until It Is Settled Right"

SOMETHING certainly is "rotten in the state of Denmark" when cities like Rochester, Syracuse and Utica can be forced to undergo weeks of turmoil and ill-feeling, and finally stoppage of street railway service, before a routine question such as a new wage scale can even be started toward settlement.

The New York State Railways operates the lines in the above cities. It is the largest electric railway company in the Second Public Service (upstate) District.

The company was perfectly willing to pay its men more but said it could not—its income was not enough.

Call it a strike or not—the point is that enough men quit work in Rochester on May 11 to stop the service and didn't go back to work till May 14. The company promised to raise the pay and take its chances on proving to the satisfaction of the city authorities that it couldn't afford to raise wages unless fares were increased.

This situation grew directly out of the Court of Appeals decision that no matter what the necessities of the company, the Public Service Commission has not the power to raise fares if they are established in the franchise. The city authorities must amend the franchise.

The company has been ready to show the facts ever since last August. Meantime, it is compelled to go on pocketing losses.

In Syracuse there is no franchise limitation, but in Rochester there is. The company enjoys public goodwill, generally speaking, in Syracuse. In Rochester a certain degree of ill-will has been developed. Just how or why need not be discussed.

In one city the company might get the consent of the city authorities to raise fares. In the other city it might fail, though the need were just as great.

The important point of it all is that here is an intolerable situation.

It were fruitless to discuss whether company, city or employees should most be blamed. The moral is plain: the State Legislature should put the Public Service Commission in full power over the affairs of the public utilities.

It was supposed in 1907 that this had been done. The people certainly wanted it done.

To leave matters as at present is to invite repetitions of the Rochester-Syracuse-Utica incidents, or worse. It will still further discourage investors from furnishing capital for the extension of street railway facilities and deprive the public of its needed service.

In any readjustment of the public service law, a speedier settlement of rate matters must be provided. At present, not only in New York State but in most others, a company must be actually suffering losses before it can apply for consideration. It cannot forestall losses with the most ordinary quality of business foresight, and it takes months and months to come to conclusions, while the losses go on.

Of the thirty odd cases put before the upstate commission in New York nine months ago, relief to companies has come to only three or four. Relief, apparently, cannot come to the rest for several months more, at least.

This is one thing, certainly, that "is rotten in the state of Denmark."

Virtues and Limitations of Steel Supports in Overhead Construction

By Charles R. Harte
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Greater Permanence and More Attractive Appearance of Steel Poles and Towers Bring Them into Keen Competition with Wood Poles for Supporting Transmission Lines and Aerial Contact Conductors

IN FAVOR of the use of wood poles in overhead construction are low first cost, ease of framing for any construction, comparatively light weight facilitating both field transportation and erection, and ease of climbing. On the other hand they have to answer for rather short life, involving not only replacement of the pole itself at frequent intervals, but also inevitable injury at such time to the attachments; for liability of burning in case of current leakage or of grass or other fires near by; and in many instances for the appearance if not the fact of obstruction to traffic. With a public not entirely in sympathy with the owners, such appearance is quite likely to lead to agitation for underground construction.



Pole in Restricted Space, Pennsylvania Railroad, Philadelphia Electrification



Pole Used to Avoid Right-of-Way Difficulties, Connecticut River Power Company



Trolley Pole Used at Albany, N. Y.



Pole, with Legs Slightly Curved, Used by New York Central Railroad



One-Piece Expanded Pole Supported Transmission Line

SEVERAL TYPES OF LATTICED STEEL POLES

The permanent poles divide naturally into several groups, namely, latticed steel poles, steel towers, tubular poles and concrete poles. The last-named will not be taken up in the present article.

Latticed steel poles are the least common and generally speaking—although there is at least one exception, the Bates pole—the most costly. In fact, until the appearance of the exception referred to, latticed poles were used chiefly in special cases where towers required too much room and tubular poles failed to give the necessary strength. For trolley service they have had some use in a few cities, and they are rather attractive in appearance, but the large amount of labor involved in their construction makes the cost excessive. For heavier service the section is usually square, with angles for corners and latticing outside. If the legs are slightly curved outward at the base, as in the case of the New York Central Railroad poles, the effect is much more pleasing than that produced with a straight taper.

Fabricated lattice poles, being almost invariably used to meet special conditions which fix the dimensions, possibly require special designing. This is best done jointly by the line engineer and the designing engineer of the shop which is to build them, in order that on the one hand the service requirements shall be met and on the other that so far as possible the details follow the regular practice of the shop. Sometimes special construction requires special details, but in the majority of cases this is unnecessary or can be avoided by unimportant changes in the main design. In a small shop doing a large variety of work with a limited equipment special designs and details do not make so much difference, but in a large establishment equipped for quantity production variations from the routine practice not infrequently double both cost and time of production.

The Expanded Type of Pole Is Promising

The latticed pole which is an exception to the high cost of the majority of types, and which seems to have a considerable field before it is, at least up to a length

of 35 ft., made from a single piece of metal, an H-beam of special section. The web of this is first slit properly by a special rotary punch, and then, after heating, the flanges are pulled apart, the web sections forming the equivalent of lattice bars, with the marked advantage that they do not require riveting. For lengths above 35 ft. two sections are spliced together. While at least at present the available stock and apparatus limits the size and capacity it would seem that heavy service square poles might well be fabricated with considerable economy by using two poles of suitable size of this type with lattice bar or plate connections. They have been employed and, it is claimed, very successfully as legs for short towers.



It's Fun to Put up a Steel Overhead Structure

Grading insensibly into poles are the steel towers, which are used very extensively on transmission lines of voltages above 22,000; and to a constantly increasing extent on the lower voltage lines. Their ability to carry long spans and thus reduce the number of insulators and their insurance against interruptions is supplemented by comparatively low cost.

We Owe Something to the Windmill Tower

While in the past there have been designs without end, there is to-day a tendency toward standardization. The steel towers first used were straightaway windmill towers, including the operating platform at the top. The platform long ago disappeared, but the general design, with light angle legs and long and lighter braces, still persists and the towers give good service too. Breakdowns, due to failure of the designers to recognize the limitations of the type, led to the development of a more rugged design. In this heavy angle legs were designed to carry all the stress, whereas in towers of the very light type it was expected that every member would take a share of the load. Finally, as a compromise between the two extremes there has been developed the scheme which is generally credited to the Italian engineer Semenza, the use of flexible supports.

The supports of a line must carry the vertical dead load due to the weights of the half spans either side. In addition, when the wind blows there is a force at right angles to the line and each span pulls in the direction of the line. As these forces in general oppose each other the support needs to meet only the *difference* in pulls. If they are balanced, either by making spans and deflections equal or increasing the sag properly on the longer span, the support need only have enough strength to carry the dead load as a column, and sufficient stiffness across the line to meet the maximum wind effort. Further, other things remaining unchanged, increasing or decreasing the sag decreases or increases the pull in exactly the same relation. For sags which are quite small in proportion to length of span, a very slight decrease or increase in the length of the conductors or, what is practically the same, an equal increase or decrease in the distance between supports without change in the length of conductor between them makes a very considerable decrease or increase in the sag. As a result there is a corresponding increase or decrease in the pull. A difference in pull, if not excessive, is automatically balanced by a small deflection of the support. In case one conductor breaks, the frame twists as well as bends, but if structural connections and wire ties are good it will usually hold up, and in many cases can be repaired.

The anchor towers for flexible construction are usually standard type square towers with such modifica-



Square Tower on the Line of the Niagara, Lockport & Ontario Power Company



Double-Circuit Tower on the Transmission Line of the Schenectady Power Company



Tower Used for Transmission Line of Connecticut River Power Company



Heavy Type of Tower on the Lines of the Housatonic Power Company

TYPICAL STEEL TOWERS USED ON TRANSMISSION LINES



Flexible Tower, Berkshire Street Railway

tion at the top as may be necessary to carry the anchor insulators. The intermediate supports are generally the so-called A-frames with channel-iron sides and braces, the latter being horizontal, and round rod diagonals. These are almost always fabricated in the shop and sent out complete except for the insulator brackets, which are as a rule of malleable iron, and are bolted on in the field. A form which also is frequently used is practically a latticed pole, having no horizontal bracing, the diagonals being angles or channels with the ends bent so they can be riveted to the legs on the center line of the webs.

Judiciously used, the flexible support scheme is exceedingly good; but unfortunately its reputation has suffered because of overenthusiasm of some of its advocates. With anchors at proper intervals, the lengths of which will depend upon the conditions and will vary from one to six per mile, and with a ground wire securely attached to each frame so it acts as a continuous tie, a flexible support line should be practically as dependable as one with rigid towers. If it is not so anchored, however, there is a possibility of stresses accumulating at one span under heavy loads, breaking the conductors and wrecking the line back to the nearest anchors. The use of guys in the direction of the line often obviates the necessity for some of the anchor towers.

Peculiar conditions demand special designs of towers, but for the average case there are several lines of stock design from which there can be chosen a form practically if not quite as good as a special type, and at much less cost. With the larger bridge companies regularly



AT LEFT, STUB TOWER FOOTINGS PROTECTED BY CONCRETE CASTINGS (Note how protection has been broken; this is the chief difficulty with this type of footing), AT RIGHT, HEAVY TUBULAR POLE WITH ROD GUYS, PENNSYLVANIA RAILROAD, PHILADELPHIA ELECTRIFICATION

making towers, and at least one company specializing in them, there is less occasion for insisting on high factors of safety than was the case a few years ago. Furthermore the designs have been so rationalized that it is possible to get a fair idea of the probable behavior under load. Practically any reputable concern which has had considerable experience in building towers can furnish either directly or with very little modification, a stock design which fully meets requirements. For this purpose a broad specification of the service required is necessary, including in this data as to the loads to be sustained and whether pin or suspension-type insulators are to be used. In the latter case particular attention must be given to insure that there are ample clearances for a swinging conductor.

As to what stress a tower should stand in the direction of the line there is considerable difference of opinion. The National Electrical Safety Code requires that for grades of construction A, B and C, in regions of

TABLE I—DEFLECTIONS OF EXPANDED POLES FOR GIVEN LOADS (MANUFACTURERS' DATA)

Section	Length in Feet	Set in Ground, Ft.	Base of Pole in Inches	Weight in Pounds	DEFLECTION IN INCHES UNDER VARIOUS DEFLECTING FORCES																												
					200 Lb.	400 Lb.	600 Lb.	800 Lb.	1000 Lb.	1200 Lb.	1400 Lb.	1600 Lb.	1800 Lb.	2000 Lb.	2200 Lb.	2400 Lb.	2600 Lb.	2800 Lb.	3000 Lb.	3200 Lb.	3400 Lb.	3600 Lb.	3800 Lb.	4000 Lb.	4200 Lb.	4400 Lb.	4600 Lb.	4800 Lb.	5000 Lb.	5200 Lb.	5400 Lb.	5600 Lb.
4 In.	20	4	7½	246	0.23	0.65	1.04	1.61	2.34	2.92	3.27	4.62	5.17	5.74	6.13																		
	25	5	8½	308	0 63	1.63	2 18	3.50	4.50	5.63	7.00	9.06																					
	30	5½	9½	370	0.75	2.25	3.81	5.63	8.18	10.25																							
	35	6	10	430	0.88	2 63	5.00	7.88																									
5 In.	20	4	9½	322	0.23	0.45	0.71	1.08	1.42	1.75	2.14	2.70	3.58	4.39	5.64	6.15																	
	25	5	10½	403	0 44	1.03	1.53	2.25	2.94	3.65	4.31	5.25	6.65																				
	30	5½	11½	483	0.81	1.31	2.05	3.12	4.62	5.50	7.18																						
	35	6	12½	564	1.06	2.06	3.31	4.56	6.00	7.56																							
6 In.	20	4	11½	404	0 18	0.31	0.45	0.58	0.74	0.83	1.11	1.35	1.66	2.11	3 42	4 46	5.99	6.69															
	25	5	12½	506	0.50	0.87	1.25	1.62	1.87	1.87	2.87	3.62	4.50	5.75	7.25	8.75																	
	30	5½	13½	607	0.50	0.87	1.25	1.62	2.31	2.93	3.37	4.12	5.12	6.56																			
	35	6	15	708	0.63	1.25	1.88	2.50	3.38	3.88	4.88	5.63	6.63																				
7 In.	20	4	13	498	0.11	0 18	0.26	0.34	0.43	0.49	0.65	0.79	0.97	1.24	2.00	2.61	3.51	3.76	4 02	4.26	4.47	4.69	4.92	5.17	5.43	5.70	5.93	6.17	6 42				
	25	5	14½	622	0 29	0 51	0 73	0.95	1 10	1.10	1.68	2.12	2.63	3 37	3.70	4.07	4.40	4.71	5.04	5.34	5.61	5.89	6 18	6 49	6.81	7.15							
	30	5½	16	747	0.30	0.54	0.78	0.98	1.35	1.71	1.97	2.41	3.00	3.84	4.22	4.60	4.97	5.32	5.69	6.03	6.33	6.65	6.98	7.33									
	35	6	17½	871	0.37	0.73	1.10	1.47	1.98	2.27	2.86	3.30	3.89	4.98	5.47	5.97	6.45	6.90	7.38	7.82	8.12												
8 In.	20	4	15	585	0.07	0.12	0.17	0.22	0.28	0.31	0.42	0.50	0.62	0.79	0.87	0.95	1.03	1.10	1.18	1.25	1.35	1.42	1.49	1.56	1.64	1.72	1.79	1.86	1.93	2.00	2.08	2.16	
	25	5	16½	731	0.19	0.33	0.47	0.61	0.70	0.70	1.07	1.35	1.68	2.15	2.70	2.94	3.18	3.40	3.64	3.86	4 05	4.25	4.46	4.68	4.91	5.15	5.35	5.56	5.78	6.01	6 25		
	30	5½	18½	877	0.20	0 35	0 48	0 62	0.86	1.10	1.26	1.50	1.54	2.45	2.85	3.10	3.35	3.50	3.83	4.06	4.26	4.47	4.64	4.92	5.17	5 43	5.65	5.88	6.12				
	35	6	20	1023	0.24	0.47	0.70	0.94	1.26	1.28	1.83	2.11	2.48	3.18	3.50	3.81	4.12	4.41	4.72	5.00	5.25	5.51	5.79	6.07	6.38	6.69							

Above table of deflections from actual test by dynamometer readings taken one-tenth length of pole below top.

TABLE II. TUBULAR STEEL POLES—DEFLECTIONS AND LOADS

Length of Pole	Description of Poles: Size and Kind of Pipe — Butt: Standard	Butt: Extra Heavy	Middle: Standard	Top: Standard	Weight of Pole	Section Lengths: Butt	Middle	Top	Pole set 6 ft. 0 in. in ground—load applied and deflection measured 18 in. from free end, probable deflections when held and loaded as stated — Load in Pounds Applied 18 in. from Free End of Pole: 100	500	600	800	1,000	1,200	1,400	1,600	1,800	2,100	2,400	2,700	3,000	Greatest Safe Load	Length of Pole
(Ft.)					(Lb.)	(Ft.)	(Ft.)	(Ft.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(Lb.)	(Ft.)
28	5		4	3	385	18	7	6	1.23													443	28
28		5	4	3	495	18	7	6	.90	4.52	5.42											603	28
28	6		5	4	509	18	7	6	.65	3.24	3.89											692	28
28		6	5	4	681	18	7	6	.46	2.28	2.73	3.64										993	28
28	7		6	5	645	18	7	6	.39	1.93	2.32	3.09										992	28
28		7	6	5	906	18	7	6	.26	1.27	1.53	2.04	2.55	3.06	3.57							1,525	28
28	8		7	6	791	18	7	6	.25	1.23	1.48	1.98	2.47	2.97								1,366	28
28		8	7	6	1,058	18	7	6	.17	.84	1.01	1.34	1.68	2.02	2.35	2.69	3.03					1,990	28
28	9		8	7	951	18	7	6	.17	.83	.99	1.32	1.65	1.98	2.31	2.64	2.97					1,817	28
28		9	8	7	1,218	18	7	6	.12	.59	.71	.94	1.18	1.42	1.65	1.89	2.12	2.48	2.83			2,527	28
28	10		9	8	1,137	18	7	6	.11	.57	.68	.90	1.13	1.36	1.58	1.81	2.04	2.37	2.71			2,432	28
28		10	9	8	1,393	18	7	6	.08	.41	.50	.66	.83	1.00	1.16	1.33	1.49	1.74	1.99	2.24	2.49	3,205	28
29	5		4	3	393	18	7	7	1.45													422	29
29		5	4	3	503	18	7	7	1.07	5.35												575	29
29	6		5	4	520	18	7	7	.76	3.83	4.58											658	29
29		6	5	4	692	18	7	7	.54	2.67	3.21	4.28										947	29
29	7		6	5	659	18	7	7	.45	2.26	2.72	3.63										946	29
29		7	6	5	920	18	7	7	.30	1.49	1.79	2.38	2.98	3.58	4.17							1,450	29
29	8		7	6	811	18	7	7	.29	1.44	1.73	2.31	2.88	3.46								1,304	29
29		8	7	6	1,078	18	7	7	.20	.98	1.18	1.57	1.96	2.35	2.74	3.14	3.53					1,900	29
29	9		8	7	974	18	7	7	.19	.96	1.15	1.54	1.92	2.30	2.69	3.07						1,733	29
29		9	8	7	1,241	18	7	7	.14	.69	.82	1.09	1.37	1.64	1.92	2.19	2.46	2.88	3.29			2,410	29
29	10		9	8	1,166	18	7	7	.13	.65	.77	1.03	1.29	1.55	1.81	2.06	2.32	2.71				2,320	29
29		10	9	8	1,422	18	7	7	.10	.48	.58	.78	.97	1.16	1.36	1.55	1.74	2.04	2.33	2.62	2.91	3,060	29
30	5		4	3	406	18	9	6	1.67													403	30
30		5	4	3	516	18	9	6	1.23	6.16												530	30
30	6		5	4	539	18	9	6	.88	4.39	5.27											629	30
30		6	5	4	711	18	9	6	.62	3.08	3.70	4.93										906	30
30	7		6	5	682	18	9	6	.52	2.60	3.12	4.17										903	30
30		7	6	5	943	18	9	6	.34	1.71	2.06	2.74	3.43	4.12								1,387	30
30	8		7	6	840	18	9	6	.33	1.65	1.99	2.65	3.31	3.97								1,245	30
30		8	7	6	1,107	18	9	6	.23	1.12	1.35	1.80	2.25	2.70	3.15	3.60	4.05					1,815	30
30	9		8	7	1,008	18	9	6	.22	1.10	1.33	1.77	2.21	2.65	3.09	3.54						1,655	30
30		9	8	7	1,275	18	9	6	.16	.79	.95	1.26	1.58	1.90	2.21	2.53	2.85	3.32				2,305	30
30	10		9	8	1,205	18	9	6	.15	.74	.89	1.18	1.48	1.78	2.07	2.37	2.66	3.11				2,220	30
30		10	9	8	1,461	18	9	6	.11	.56	.67	.90	1.12	1.34	1.57	1.79	2.02	2.35	2.69	3.02		2,920	30
31	5		4	3	413	18	9	7	1.95													387	31
31		5	4	3	523	18	9	7	1.44	7.18												527	31
31	6		5	4	549	18	9	7	1.02	5.09	6.12											603	31
31		6	5	4	721	18	9	7	.72	3.58	4.29	5.72										867	31
31	7		6	5	696	18	9	7	.60	3.00	3.60	4.80										865	31
31		7	6	5	958	18	9	7	.40	1.98	2.38	3.18	3.97	4.77								1,325	31
31	8		7	6	840	18	9	7	.38	1.90	2.29	3.05	3.81									1,192	31
31		8	7	6	1,127	18	9	7	.26	1.30	1.55	2.07	2.59	3.11	3.63	4.15						1,740	31
31	9		8	7	1,031	18	9	7	.25	1.27	1.52	2.03	2.54	3.05	3.56							1,585	31
31		9	8	7	1,299	18	9	7	.18	.91	1.09	1.46	1.82	2.18	2.55	2.91	3.28	3.82				2,205	31
31	10		9	8	1,234	18	9	7	.17	.85	1.02	1.36	1.70	2.04	2.38	2.72	3.06	3.57				2,125	31
31		10	9	8	1,491	18	9	7	.13	.64	.77	1.02	1.28	1.54	1.79	2.05	2.31	2.69	3.07	3.45		2,795	31
32	5		4	3	427	19	9	7	2.17													371	32
32		5	4	3	545	19	9	7	1.61	8.02												505	32
32	6		5	4	568	19	9	7	1.14	5.70												578	32
32		6	5	4	749	19	9	7	.80	4.01	4.82	6.42										832	32
32	7		6	5	720	19	9	7	.68	3.37	4.05	5.40										830	32
32		7	6	5	995	19	9	7	.45	2.22	2.67	3.56	4.45	5.33								1,275	32
32	8		7	6	888	19	9	7	.43	2.14	2.57	3.43	4.28									1,143	32
32		8	7	6	1,169	19	9	7	.29	1.46	1.75	2.33	2.92	3.50	4.08	4.67						1,665	32
32	9		8	7	1,066	19	9	7	.29	1.43	1.72	2.29	2.86	3.43	4.00							1,520	32
32		9	8	7	1,348	19	9	7	.20	1.02	1.22	1.63	2.04	2.45	2.85	3.27	3.67	4.28				2,115	32
32	10		9	8	1,274	19	9	7	.19	.96	1.15	1.53	1.92	2.30	2.69	3.07	3.46					2,035	32
32		10	9	8	1,545	19	9	7	.14	.72	.86	1.15	1.44	1.73	2.02	2.31	2.59	3.03	3.45			2,680	32
33	5		4	3	439	19	10	7	2.48													357	33
33		5	4	3	555	19	10	7	1.83													487	33
33	6		5	4	582	19	10	7	1.30	6.49												555	33
33		6	5	4	764	19	10	7	.91	4.56	5.47											798	33
33	7		6	5	739	19	10	7	.77	3.83	4.60											797	33
33		7	6	5	1,015	19	10	7	.51	2.53	3.04	4.05	5.07	6.08								1,255	33
33	8		7	6	910	19	10	7	.49	2.43	2.92	3.89	4.87									1,098	33
33		8	7	6	1,192	19	10	7	.33	1.65	1.99	2.65	3.31	3.97	4.63	5.30						1,605	33
33	9		8	7	1,094	19	10	7	.33	1.62	1.95	2.60	3.25	3.90	4.55							1,460	33
33		9	8	7	1,376	19	10	7	.23	1.16	1.39	1.86	2.32	2.78	3.25	3.71	4.18					2,035	33
33	10		9	8	1,308	19	10	7	.22	1.09	1.31	1.74	2.18	2.62	3.05	3.49	3.93					1,955	33
33		10	9	8	1,579	19	10	7	.16	.82	.98	1.31	1.64	1.97	2.30	2.63	2.95	3.28	3.94			2,580	33
34	5		4	3	454	20	10	7	2.75													343	34
34		5	4	3	575	20	10	7	2.03													467	34
34	6		5	4	601	20	10	7	1.44	7.21												531	34
34		6	5	4	792	20	10	7	1.01	5.08	6.09											768	34
34	7		6	5	763	20	10	7	.86	4.28	5.13											767	34
34		7	6	5	1,053	20	10	7	.56	2.81	3.37	4.49	5.62									1,177	34
34	8		7	6	939	20	10	7	.54	2.71	3.25	4.33	5.42	6.51								1,057	34
34		8	7	6	1,235	20	10	7	.37	1.85	2.22	2.96	3.70	4.44	5.18							1,543	34
34	9		8	7	1,128	20	10	7	.36	1.81	2.17	2.89	3.62	4.34	5.07							1,405	34
34		9	8	7	1,425	20	10	7	.26	1.29	1.55	2.07	2.59	3.11	3.63	4.15	4.67					1,955	34
34	10		9	8	1,348	20	10	7	.24	1.21	1.45	1.93	2.42	2.90	3.39	3.87	4.36					1,885	34
34		10	9	8	1,634	20	10	7	.18	.92	1.10	1.46	1.83	2.20	2.56	2.93	3.29	3.84	4.39			2,480	34
35	5		4	3	469	21	10	7	3.03													331	35
35		5	4	3	595	21	10	7	2.23													450	35
35	6		5	4	620	21	10	7	1.59	7.97												515	35
35		6	5	4	810	21	10	7	1.12	5.60	6.72											741	35
35	7		6	5	787	21	10	7	.95	4.73	5.68											738	35
35		7	6	5	1,091	21	10	7	.62	3.12	3.75	4.99	6.24									1,135	35
35	8		7	6	968	21	10	7	.60	3.01	3.61	4.82	6.02									1,018	35
35		8	7	6	1,278	21	10	7	.41	2.05	2.46	3.28	4.10	4.92	5.74							1,485	35
35	9		8	7	1,162	21	10	7	.40	2.01	2.41	3.22	4.02	4.82								1,355	35
35		9	8	7	1,474	21	10	7	.29	1.43	1.72	2.29	2.87	3.44	4.02	4.59	5.17					1,885	35
35	10		9	8	1,388	21	10	7	.27	1.35	1.62	2.16	2.70	3.24	3.78	4.32	4.87					1,818	35
35		10	9	8	1,689	21	10	7	.20	1.01	1.21	1.62	2.02	2.42	2.83	3.23	3.64	4.24				2,390	35

heavy loading, the wind pressure shall be taken at right angles to the direction of the line and shall be assumed, for cylindrical surfaces, at 12 lb. per square foot of protected area for grade A, 7 lb. for grade B, and 4 lb. for grade C. The conductors are figured as being covered with a layer of ice, increasing the conductor diameter by 1 in., while the supports are figured as bare. For flat surfaces these pressures are to be increased by 60 per cent, making them 19.2, 11.2 and 6.4 lb., respectively. Latticed faces are taken as having an area 50 per cent greater than actual, to allow for the effect of the wind blowing through the spaces and so against the inside of the opposite face, unless this gives a total pressure greater than would result if the structure were solid. In this case the latter value should be used.

Steel structures are required to have a minimum factor of safety of two against these stresses. The use of guys to secure this is considered undesirable although they can be used if necessary. In the latter case if the support can deflect much the guys must be capable of taking all the stress, the support being considered as acting only as a strut.

When steel supports or towers are used which will not stand as great stresses longitudinally as those prescribed for the transverse strength, anchor towers capable of withstanding the total pulls of all the conductors up to a maximum of 10,000 lb. plus one-half the excess above 10,000 lb. shall be placed at intervals not greater than ten spans apart.

The code requirements have in mind protection to the individual and do not apply to lines in the country, but maintenance of service practically demands similar construction standards. And there is a point in this connection which is often missed. The transmission or distribution lines, even when most substantially built, represent but a very small percentage of the total cost of the system. The interest on the idle investment plus the loss of revenue during a short shutdown due to a line failure will very nearly pay the difference between "cheap and nasty" construction and a first-class line.

Steel Templates Are Best in Setting Tower Footings

Tower foundations are of several types. For structures subject to heavy stresses large concrete footings with anchor bolts are usually employed. A plan which is being followed more and more is to use "stubs," which are practically short extensions of the tower legs with a piece of channel or angle iron at right angles at the end, forming an inverted T. These are sometimes bedded in concrete in place, and sometimes have concrete cast about them at a central yard. More and more frequently they are set directly in the earth, with some rock filling if the tower is to carry heavy stresses or if the ground is soft. Bolts or stubs are best placed by means of a template made of structural steel, which holds them in exactly correct position until the concrete is set or the earth is rammed. Wood templates are cheaper in first cost but are easily injured, and the cost of correcting one wrong footing even in good country, particularly if, as is usually the case, the trouble is not discovered until the tower is raised into position, will eat up the "economy" and more.

Of the other metal supports the diamond, tripartite, and several other special forms of poles are used to a very limited extent. The diamond pole consists of two parts of high strength steel of V-shape, with specially flanged edges. When properly interlocked these form a diamond section which is set so that the main strains come in the line of the diagonals. While this pole is light and strong the joints are said to render it particularly subject to corrosion. Its chief use is for trolley overhead. The tripartite pole has three legs of Bessemer steel, each of U-section, of such dimensions that each size just fits inside the next larger. The legs are held, with the "round" out, by means of spreaders and collars. Of these there is a large variety, so that a great many combinations of leg sections can be made with any one of many tapers. There have been several installations of this type of pole on transmission lines, notably those of the United States Reclamation Service in connection with the Roosevelt Dam project in Arizona, and the Pueblo line of the Anglo-Mexican Hydroelectric Company of Mexico City, Mexico. The first line has both single and double three-phase circuits of No. 2 copper, in spans of from 300 ft. to 400 ft., on poles 40, 45 and 50 ft. in length. The Mexican line has one three-phase circuit of No. 1 copper and a pair of No. 8 telephone wires in spans of from 285 ft. to 350 ft., on poles 43 ft. 7 in. long, with one leg extended 6 ft. above the top of the pole proper to take a ground wire.

There Are Still Too Many "Standard" Tubular Poles

Tubular poles, originally made up from iron pipe, now consist of special steel tubing and are listed in innumerable combinations, while even more can be had as "specials." In 1913 the American Electric Railway Engineering Association "standardized," cutting down the number between the lengths of 28 ft. and 35 ft. to only ninety-six, there being twelve of each length. As a matter of fact it would seem entirely practicable to reduce the list to not more than thirty "regulars," for many of the sizes listed are very heavy for their strength, and it hardly seems necessary to have lengths varying by single feet.

While tubular poles are practically standard for city trolley lines they have had very little use in transmission service except when the latter lines were on trolley poles. They are, however, coming into use in heavy electrification overhead, notably on the Norfolk & Western, the Pennsylvania at Philadelphia, and the New York Connecting Railroad. In these installations poles of extra large size and strength are employed, and with the solid steel-rod guys are really more of the nature of "baby" towers than poles.

The tubular pole tends to corrode both on the inside and at the ground line, "man's best friend" playing no mean part in the latter, although to-day it is almost universal practice to buy tubular poles with a protecting "dog sleeve" extending a foot or so above the ground. Interior corrosion is less serious; it can be prevented by filling the pole with concrete, but the large majority of users believe that the cost of the protection is greater than the results warrant, and the practice is not common.

Table II, from the 1915 report of the American Electric Railway Engineering Association, gives full and most valuable details of tubular poles of standard sizes.

Getting More Energy Out of Coal in the Power Plant

By Hartley LeH. Smith
Chief of Testing Bureau
Brooklyn Rapid Transit System

Good Station Operation Involves a Knowledge of the Heating Value of the Fuels Used—Coal Cost Is So Large an Element in Total Operating Cost that Conservation in Its Use Can Effect Large Economies

THE cost of coal is so great an item in the total operating cost of producing electrical energy at the switchboard of a power plant that its efficient use effects a tremendous saving, while its inefficient, negligent use cuts down dividend rates not by fractions but by integers. This cost varies from about 55 per cent in average localities during normal times to as much as 85 per cent in districts somewhat remote from mines in these days of coal scarcity and deteriorated quality.

As mentioned in an earlier article dealing with water in steam-driven electric power plant operation, the finished product in the power plant is kinetic energy in electrical form, while the fundamental raw material, using the term "material" in a rhetorical sense only, is the potential heat energy of the coal. The coal itself as an actual material substance involves problems so numerous and difficult to handle that broad technical knowledge is needed in the boiler room for their solution. It is here that men properly equipped can do most to make the whole plant most highly efficient and produce a saving that will show to advantage in the report of power cost.

Excessive Combustible in the Ash Is Reprehensible

The chief problem with coal is to burn it. This is the engineer's problem, and it is a difficult one, although the purchasing agent may think just now that his problem is still more difficult. A lot of the coal which enters the power plant never does get burned. This fact has led many power plant operators to make the determination of combustible in the refuse a routine procedure. Probably many operators do not realize how great a loss can be occasioned by allowing refuse unduly rich in combustible to leave the plant. When the percentage of true ash in the coal is high the danger is particularly great.

Omitting refinements the approximate formula for the loss in the combustible, expressed as a decimal fraction, is:

$$Loss = \frac{(f + y)xy}{f(1 - x)}$$

Where

f = fixed carbon in coal
y = true ash in coal
x = combustible in refuse, all in per cent.

The loss may be expressed as a percentage thus:

$$Loss = \frac{(f + y)xy}{f(100 - x)}$$

A still simpler formula, if the fixed carbon is not known but if data are available as to the combustible in the refuse and the ash in the coal, is:

$$Loss = \frac{xy}{(1 - x)(1 - y)}$$

Or, in per cent,

$$Loss = \frac{100xy}{(100 - x)(100 - y)}$$

For example, if the fixed carbon is 76 per cent, the true ash is 6 per cent and the combustible in the refuse is 15 per cent, then the power plant loss is 1.1 per cent. Again, if the fixed carbon is 62 per cent and the true ash in the coal is high, say 18 per cent, while the combustible in the refuse is 30 per cent, the power plant loss is 9.9 per cent.

To avoid large losses of this kind the fires must be well burned down before cleaning, or dumping, if they are stoker fires. Such burning down is not a hardship to the fireman, and only adequate and tactful supervision is required to bring it about. Such burning down does not need to have charged against it a period of undesirably low steaming rate, for fires while being burned down are capable of making steam actively.

Clinkers Do Not Necessarily Mean Low Efficiency

The subject of clinker in the refuse is of considerable interest in this connection. Where there is much clinker there is apt to be very little combustible. The writer noticed this some years ago and called attention to it in a letter written to the editors of *Power*, in September, 1905. Some time later he was interested to find reference to the letter, with confirmation of the relationship mentioned, in Bulletin No. 325 of the United States Geological Survey.

When clinker forms with any freedom it is obvious that combustion is occurring at high temperature. A temperature high enough to melt ash does not let much carbon go unburned. Of course, no one is desirous of encouraging the formation of clinker with its attendant troubles, but there is at least some consolation in the fact that when it does form the refuse losses due to the presence of combustible are small.

The nature of the true ash primarily determines the extent of clinkering. The main point seems to be that burning all but the last bit of carbon involves the burning of some carbon which is surrounded by great quantities of ash. For this high temperature is required, and at this high temperature at least some of the ash will fuse or melt.

Some Lessons from Domestic Fuel Consumption

On the general subject of combustible in the refuse of the power plant it is interesting to turn for a moment to that of the domestic use of coal in house heaters.

Here we know that the use of the rotary ash sifter has done wonders in cutting down coal consumption. Mainly no doubt, this has come about through making the rejected ash practically true ash almost in powdered form. Another saving perhaps is through the more complete burning of the volatile matter of the coal when each charge of green coal is covered with a layer of sifted cinders.

An engineer in a recent letter to *Power* stated that last year 8 tons of coal had been burned in his heater with no sifting of ashes, while during the current year, up to the time of writing, less than 6 tons had been burned and he expected that the season's consumption would be but 6½ tons. This letter was called forth by an editorial in the same paper dealing not with ashes from house heaters rich in combustible but those from many private plants in large cities. The central stations, under present conditions, have patriotism as well as fuel economy to consider.

Buying Coal According to Specifications

On the subject of coal specifications not much need be said in these days nor apparently for some time to come on account of the general fuel situation. When, however, specifications were more useful than at present, in most cases it was the heating value of the coal which was considered the most important active control factor in business dealings between coal consumer and coal dealer. Sometimes, however, the ash and volatile matter were specified, with bonus and penalty clauses included.

The determination of heating value by means of a bomb calorimeter is now quite general practice, and where the coal is received in barges and, therefore, in units of hundreds of tons, a determination of the heat content of every barge load is frequently undertaken. The trouble and cost are looked upon as worth while even if the results are only useful for purpose of record. Where such record is available there is no doubt that extensive use is made of it in that operation known commonly as "registering a kick."

It Is Often Important to Know the Ash Fusion Temperature

Along with the growing practice of making calometric determinations of coal there are many plants which also make frequent measurements of the actual fusion temperature of the ash in the coal. This is especially true in plants having large installations of underfeed stokers, for such stokers inherently operate with high furnace temperatures. It might perhaps be more accurate to say that they operate inherently with zones of very high temperature in the fuel beds and particularly at high ratings. For this reason the ash fuses, and there is trouble with the furnace walls unless the ash of the coal has decidedly high fusion temperature.

To justify the expense of laboratory work for the measurement of fusion temperature of ash in coal shipments, etc., there must be furnished an opportunity to prevent damage by ash with low fusion temperature. This is especially true where such coal is to be kept out of underfeed stokers. It is always somewhat difficult to arrange this, for it involves a laboratory equipped and manned on a scale making possible the putting through of tests with a rush. The writer was once told by a man in considerable authority in a large plant that the men in his plant could tell how the cones of ash were going to act in the high-temperature laboratory furnace by the extent to which the coal had clinkered on the underfeed stokers. This is surely "getting the cart before the horse."

Ultimate Analyses of Coal Are Not Necessary

So far as the analysis of coal goes it may be said that no plant makes ultimate analyses. Proximate analysis is relied upon entirely. For the purpose of registering effective complaints such analysis is greatly superior to the mere determination of heating value. It furnishes ammunition for campaigns of complaint about the amount of volatile matter and a corresponding tendency to produce smoky flue gases, about the heating value, also, because the determination of ash, volatile matter and corresponding fixed carbon permits very close calculations of heating values. But the power plant man cannot kick about the moisture, for the coal man will always say that "it rained."

Just a word more about the heating value of coal. This is obtained with great accuracy in a bomb calorimeter or approximately by calculation from the result of proximate analysis, and whether or not many of the data are looked upon as worth while, anyway, just as a matter of record, it is positively essential to know the heating value of the coal so that the thermal efficiency of the station can be calculated. Every engineer nowadays wants to calculate the thermal efficiency of his plant. It is impossible otherwise for him to know what he is doing with his plant. My advice, therefore, to the power plant man who lacks a calorimeter, crucibles, gas burners and oxygen tanks is to make out a requisition for these necessaries. The boss will surely sign it.

What About the Poor-Quality Coal That We Are Getting Now?

The present crisis in the coal industry has produced a great deal of irregularity in the quality of coal and it has deteriorated noticeably. A great deal has been written to explain this situation and to outline the steps that the government might take to restore conditions more nearly to normal. Lately the federal Fuel Administrator has issued regulations for the purpose of improving conditions. Power plant engineers have complained bitterly of the quality of coal which they are receiving.

Undoubtedly in many instances coal has been supplied which, because of its poor quality, has produced an alarming rise in maintenance cost of furnace equipment. In some cases, however, the poor quality has meant little more than a serious lowering of heating value. It seems to me sometimes that users of high-quality coal grow to be a pampered element in our population. Barring coal of low heating value which happens also to be characterized by low fusing temperature of ash, it seems to me to be an open question whether something other than very high-quality coal is not the most suitable for power-plant service. Of course, very high-quality coal is not used in many large power plants. There is not, in truth, enough of it to go around. Even in normal times the steamship trade

takes most of this coal and it is proper that it should do so. Aside from the steamship trade really good coal should be looked upon as a luxury which only the rich among corporations can afford.

In power-plant service the dictum is sometimes heard: "The cheapest coal to buy is the cheapest coal to burn," but this is a very unsafe dictum if taken without reservation. It is, however, one which bears examination in concrete cases, but such examination has a reliable basis only in tests of the evaporating quality of the fuel. These tests should be comprehensive and planned definitely to cover a range of steaming rates wide enough to reveal possibilities of economical use of the coal under conditions of station operation possibly differing somewhat from the normal.



Don't Lose a Single B.T.U. Out of This Bucket of Coal

Such conditions may be entirely satisfactory and may, in fact, resemble those which have long been used elsewhere.

The great problem with coal, as stated before, is to burn it efficiently. We shall assume that it has been properly selected; that it is of quality not too good for the circumstances, and not too cheap, if cheapness is accompanied by the presence of clinkering qualities caused by ash with low fusing temperature. Further, we shall assume that proper supervision has been provided and good firing methods ingrained in the fireman so as to insure no large loss of combustible through the ashpits. The next question is how the heat loss up the stack is to be kept moderate or low. This is a very important question. Many people are willing to step forward to tell us how to answer it, or to write articles about it. Engineering societies spend unhappy evenings discussing it. Makers of instruments are anxious to provide equipment designed to make the solution of the problem easy. Personally I do not desire to be one of the general company of wisacres along this line.

There was a time when I was much impressed with magazine articles demonstrating so easily the enormous heat losses through the stacks occasioned by decreasing values of CO_2 (on the false basis that the flue temperature remained unchanged). The savings to be made by high CO_2 were heralded so widely that the power-plant operator who had escaped being greatly impressed thereby was surely a "wayfaring man and a fool." I was, however, much depressed by the absence of sharply definite counsel on how to get high CO_2. The articles simply said when the CO_2 percentage is high the excess air is low.

A Practical Demonstration in Efficient Boiler Operation

I found out later how to manipulate the furnaces and drafts so as to produce a high percentage of CO_2, but along with this knowledge came the conviction that such manipulation is not worth while. The following experience contributed to this conclusion.

I was conducting a series of tests on a water-tube boiler fired by an overfeed stoker using semi-bituminous coal low in ash and of a quality considered particularly suited to the station conditions. This coal had long been used in the station and on the stoker in question. There had been conferences, tests and what not for a long time in regard to the operation of the equipment. The stoker manufacturer sent an expert operator to do his bit.

The tests were made long after the stokers had been installed. They included three series of tests exactly alike except that during each of the series a different man was in charge. Each man operated with unimpeded control except in one particular, namely, that the flue draft was maintained during each eight-hour test by a man who watched constantly a draft gage connected to the flue nozzle on the boiler side of the damper and manipulated the damper so as to maintain constant draft.

Each series consisted of five tests of eight hours each, and flue drafts of 0.36 in., 0.40 in., 0.44 in., 0.48 in. and 0.52 in. water column were used. Each man operated the stoker with these drafts, there being fifteen tests in all. Each man manipulated the stoker mechanism to suit himself, adjusting the rates of coal feed and grate movement, deciding when and how to dump ashes, etc.

In every way he did what he pleased except that the draft at the flue nozzle was established for him. The coal and water were weighed, the gas was analyzed for his inspection, temperature and pressure measurements were made and displayed to his view if he cared to look at them.

High Efficiency Accompanies Low Coal Consumption

As previously stated, one man was an expert sent by the stoker manufacturer. Another was a head fireman who ordinarily did not run stokers but graduated years before and put in his time eight hours a day showing others how to do it. The third man was a good stoker operator but of no particular skill, and he was quite illiterate judged by any standards current among combustion experts. He could barely speak the English language.

Now I am not going to say that the last man beat the other two. It is not so easy as all that. At every one of the five values of flue draft the highest economy of evaporation, the highest over-all efficiency by far, was attained by the man who at each particular value of flue draft used the least coal per hour. At one draft value it was one man, at another another man. Each of the three men secured honors in the tests, but how they were divided I do not remember. Always, however, the man who with a given flue draft used less coal than the other two at the same draft was the man who won out, and by a large margin.

This conclusion that the least coal at a given flue draft corresponded to the best operation is worthy of careful thought. Does it mean the use of a thin fire? Does it argue for considerable excess air? I leave these questions to the reader as a profitable subject for his reflection. The problem is obviously a vital one if fuel consumption is to be fully controlled.

Proper Analysis Is Fundamental in Choosing Railway Motors

By C. W. Squier
Electrical Engineer

The Writer Shows How Speed-Time Graphs Are Constructed and Describes the Considerations Which Are Necessary for Proper Choice of Car Motors

RAILWAY motor characteristic curves show speed in miles per hour with a certain gear ratio and size wheel, tractive effort at the rim of the wheel and efficiency. The efficiency is usually expressed as the relation between the electrical input to the motor and the mechanical output from its armature shaft. By deducting the losses in the gears connecting the armature shaft with the car axle, we obtain the relation between the electrical input to the motor and the output at the rim of the car wheels. This relation is referred to as "efficiency with gears" and is the one most generally used, although it is desirable to have both given in order to eliminate errors made by determining gear and friction losses by different methods.

Motor characteristics form the basis of all calculations of motor performance, and in comparing motors for a particular service it is usual to replot the curves as furnished by the manufacturer, making any changes necessitated by any difference in voltage, gear ratio or diameter of driving wheels. The following formulas give the various changes in speed and tractive effort as effected by a change in gear ratio or diameter of wheels:

S = Speed ordinate for any current value on original curve.
S_1 = Speed ordinate for any current value on derived curve.
T = Tractive effort for any current value on original curve.
T_1 = Tractive effort for any current value on derived curve.
D = Diameter in inches of driving wheels for original curve.
D_1 = Diameter in inches of driving wheels for derived curve.
G = Gear ratio for original curve.
G_1 = Gear ratio for derived curve.

Then:

$$S_1 = \frac{(G \times D_1)}{(G_1 \times D)} S \text{ and } T_1 = \frac{(G_1 \times D)}{(G \times D_1)} T$$

For example, suppose we have the characteristic curve for a motor with 33-in. wheels and 15: 69 = 4.6 gear ratio and we wish to find the desired curves for 30-in. wheels and 17: 67 = 3.94 gear ratio.

$$\text{Speed ordinate } S_1 = \frac{4.6 \times 30}{3.94 \times 33} S = 1.061S \text{ and}$$

$$\text{Tractive effort ordinate } T_1 = \frac{3.94 \times 33}{4.6 \times 30} T = 0.942T$$

The factors by which the speed and tractive effort at any current are to be multiplied to give the derived valves are the reciprocals of each other. It should also be noted that in changing the gear ratio on the same motor, the sum of the number of teeth in the pinion and gear must remain the same.

The voltage at the terminals of a railway motor may be divided into two parts, the counter-emf. and the voltage required to overcome the internal resistance of the motor. This last component is equal to the product of the resistance in ohms by the current in amperes and is thus constant for any given current regardless of the terminal voltage. In a certain 50-hp. motor with a resistance of ½ ohm 20 volts are necessary to force 40 amp. through the windings, and for any other current the value will be proportional.

The speed of a railway motor when operating with any given current is directly proportional to its counter-emf., that is, the voltage produced by the armature conductors cutting the magnetic flux.

Thus,

$$\frac{S_1}{S} = \frac{E_1 - Ir}{E - Ir}$$

where

E is the terminal voltage for the original curve
E_1 is the terminal voltage for the derived curve
I is the current value
and r is the internal resistance of the motor

If the 50-hp. motor referred to above is operating at 40 amp. and 600 volts, the voltage required to overcome the internal resistance is 20 and the counter-emf. is 580 volts. If the voltage at the terminals is reduced to 500, with the same current, the counter-emf. will be 480 volts and the speed of the motor will be reduced in the same proportion. The ratio of 480 to 580 is 0.827 and if the speed at 600 volts was 17 m.p.h, it would be reduced to 14.06 m.p.h. at 500 volts. It is thus seen that the speed is reduced in greater proportion than the terminal voltage, for the ratio of 500 to 600 is 0.833. It follows, then, that if the resistance of a motor is known, the characteristic curves at any desired voltage can be readily calculated from the curves available.

Some graphical methods for determining the speed ratio for different changes in terminal voltage were given in the issues of the ELECTRIC RAILWAY JOURNAL for March 13 and Sept. 18, 1915, and serve to illustrate these relations very clearly.

The tractive effort produced by the motor is independent of the voltage, being determined by the current alone. Hence, as long as the motor is drawing a given current the torque and resulting tractive effort will be essentially the same regardless of the voltage at its terminals.

Speed-Time Curves Show Motor Performance for a Particular Service

Before making a comparison of the service furnished by different motors, I shall discuss briefly a method for calculating and constructing the speed-time curves. The data for the duty cycle were given in the previous article in the ELECTRIC RAILWAY JOURNAL of April 20. The characteristic curves of a tapped field motor, to be used in the present calculations are shown in Fig. 1.

In starting a car resistance is placed in series with the motors, and this is gradually cut out by the action of the controller until finally the full line voltage is applied to the motors. This period of the operating cycle is known as the rheostatic accelerating period. Assume an average acceleration for this period of 1½ m.p.h.p.s. To produce an acceleration of 1 m.p.h.p.s. requires 100 lb. per ton, so that 150 lb. per ton will be required to give the acceleration desired. As the car with seated load weighs 23.56 tons, there must be 150 × 23.56 or 3534 lb. net tractive effort for the car or 1767 lb. per motor to give the required acceleration. In addition to this, the motor must produce the tractive effort necessary to overcome the train resistance, as shown by the graphs shown in Fig. 6 of my article in the issue of April 20.



Better to Sweat Over a Motor Characteristic than Over the Motors

In order to determine the point on the speed-time curve at which all of the starting resistance is cut out and the motors have full line voltage applied to them, it is most convenient to use an auxiliary curve sheet of the form shown in Fig. 2.

This method was first brought to my attention in an article by W. S. Valentine in the STREET RAILWAY JOURNAL of Sept. 6, 1902. It has been described several times since in various handbooks and technical papers.

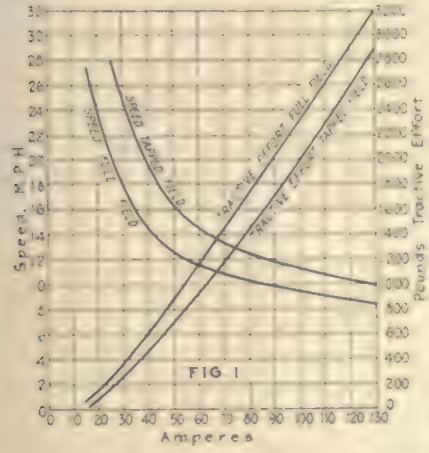
These graphs, Fig. 2, are constructed as follows: A scale of pounds net tractive effort per motor is laid off along the horizontal axis and scales of speed and acceleration are laid off along the vertical axis. The train resistance graph, *RR*, is first plotted, showing train resistance per motor for the different speeds. The graphs of net tractive effort, *LS* and *MN*, are obtained by taking the tractive effort at any speed from the motor characteristic curves Fig 1, and subtracting the train resistance for that speed from this.

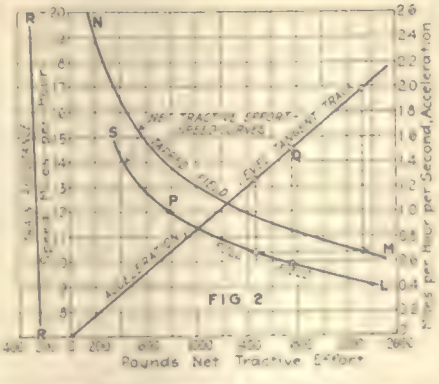
Thus at 12 m.p.h. the tractive effort with full field is 1060 lb., less 262 lb. train resistance, which leaves 798 lb. net tractive effort. These values are then laid off and the point *P* on the graph is determined. Other points are obtained in a similar manner. With tapped-field motors two graphs are obtained as shown. Since the rate of acceleration is directly proportional to the net tractive effort, a straight line drawn through zero at the proper angle will be the graph of acceleration on straight level track. In our case it required 1767 lb. per motor to give an acceleration of 1½ m.p.h.p.s. This locates the point *Q*, and the line *OQ* gives the acceleration for different values of net tractive effort. From the curve *LS* we see that 1767 lb. net tractive effort is obtained at a speed of 9.9 m.p.h. Hence the car will accelerate at the rate of 1½ m.p.h.p.s. until this speed is reached, when full line voltage will be applied to the motor.

There are many graphical methods used for plotting speed-time curves, and all possess considerable merit. My experience has shown that the step-by-step process gives a clearer understanding than others of the actual mechanics of car performance and a firmer grasp on the theory underlying the construction of the curves. After such an understanding has been obtained graphical methods are of great assistance in reducing the labor involved, especially when it is necessary to plot many curves.

In the following table are tabulated values for each step of the speed-time-curve construction. As the motor characteristic curves give tractive effort for a single motor it is more convenient to figure the pounds train resistance and net tractive effort per motor instead of per car.

Miles per Hour	Per Motor: Amperes		Per Motor: Tractive Effort	Per Motor: Train Resistance	Per Motor: Net Tractive Effort	Rate of Acceleration	Seconds from Start
9.9	90	F.F.	2,018	251	1,767	1.50	6 6
10.35	80	F.F.	1,735	253	1,482	1.26	6.93
10 35	120	T.F.	2,580	253	2,327	1.98	6.93
11.00	106	T.F.	2,160	256	1,904	1 62	7.29
12 00	88	T.F.	1,660	261	1,399	1 19	8 00
13.00	74	T.F.	1,300	265	1,035	0.87	8.97
14.00	64	T.F.	1,040	270	770	0.65	10 29
15.00	57	T.F.	870	275	595	0.51	12.01
16.00	51	T.F.	750	280	470	0.40	14.23
17 00	47 5	T.F.	650	286	364	0.31	17.09
18 00	44.5	T.F.	580	292	288	0.245	20.70
19 00	42	T F.	510	297	213	0 180	25 41
20 00	39	T.F.	460	303	157	0 134	31.78





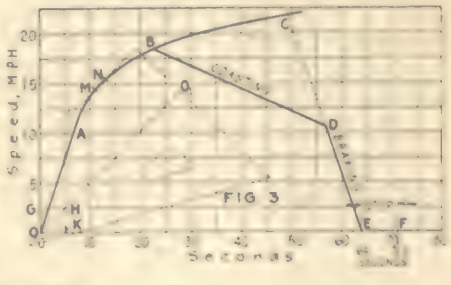


Fig. 1—Typical Motor Characteristic Curves

Fig. 2—Acceleration and Tractive Effort Graphs

Fig. 3—Typical Speed-Time-Curve Construction

GRAPHS USED IN SPEED-TIME-CURVE CONSTRUCTION

A speed of 9.9 m.p.h. corresponds to a current of 90 amp. I have assumed a lower current limit setting of 80 amp. so that the motors operate with full field until the current falls to this value, when the change to tapped field is made. This will occur at a speed of 10.35 m.p.h. as will be seen from the characteristic curves Fig. 1.

To construct the speed-time curve of Fig. 3, we use the figures in the table as follows: As the car accelerates at a rate of 1½ m.p.h.p.s. up to 9.9 m.p.h., the time required to reach this speed is 9.9/1.5 = 6.6 seconds. This determines the point *A* on the curve, and the line *OA* represents the straight line or rheostatic accelerating period.

As the car increases its speed the current, tractive effort and rate of acceleration decrease and at a speed of 10.35 m.p.h. the current will have fallen to 80 amp. and the rate of acceleration will be 1.26 m.p.h.p.s. Since the tractive effort and acceleration decrease uniformly as the car increases in speed, we may assume without serious error that the average acceleration during this period is the average of the initial and final accelerations. The average rate of acceleration between 9.9 and 10.35 m.p.h. is ½ (1.5 + 1.26) = 1.38 m.p.h.p.s.

In using this method speed intervals greater than 3 m.p.h. should not be used. Usually an interval of 1 m.p.h. will be found very convenient. To increase the speed from 9.9 to 10.35 m.p.h., a difference of 0.45 m.p.h., at a rate of 1.38 m.p.h.p.s. requires 0.45/1.38=0.326 second, and the car reaches the speed of 10.35 m.p.h. in 6.6 + 0.326 = 6.926 seconds from the start. This gives another point on the speed-time curve, and at this point the change from full to tapped field is made, and a sudden increase in acceleration takes place. This increase in acceleration can best be followed by referring to the graphs shown in Fig. 2. From an acceleration rate of 1.26 m.p.h.p.s. with a net tractive effort of 1482 lb. on full field we reach 2327 lb. net tractive-effort and an acceleration of 1.98 m.p.h.p.s. with tapped field. A study of these graphs shows the desirability of limiting the current swing when changing to tapped field. Above this point the values of tractive effort are taken from the tapped-field tractive-effort curve. At 15 m.p.h. the current is 57 amp., the tractive effort 870 lb. per motor, the train resistance 275 lb. per motor and the net tractive effort 870—275=595 lb. per motor. Therefore the rate of acceleration at 15 m.p.h. is 595/1178 or 0.505 m.p.h.p.s. Other points are found in the same manner and the curve *AC* is thus determined.

Short-Cuts in Making Speed-Time Curves

In order to save time and labor in constructing speed-time curves I make use of several modifications of the preceding methods and the following has been found especially convenient:

By taking speed intervals of 1 m.p.h. and by assuming that the acceleration for any speed starts ½ m.p.h. below and continuous for ½ m.p.h. above this speed, we can omit figuring the time given in the table preceding. To illustrate this let us take the speed of 15 m.p.h., with its corresponding acceleration of 0.505 m.p.h.p.s. as found above. The slope of the speed-time curve through 15 m.p.h. is determined by drawing the line OO_1, starting from *O* and passing through the 5.05 m.p.h. point at 10 seconds. This corresponds to an acceleration of 0.505 m.p.h.p.s. To plot the curve take a triangle and lay one edge along the line OO_1, then slide the triangle along so as to draw the line *MN* for the speed-time curve parallel to OO_1, starting at 14½ m.p.h. and continuing to 15½ m.p.h. The slope for the acceleration at 16 m.p.h. starts at 15½ m.p.h. and continues to 16½ m.p.h. and so the curve is constructed with short straight lines. This provides a very rapid as well as accurate method of constructing the curve.

What Coasting and Braking Periods Mean

The speed-time curve as calculated so far shows the performance of the car while the motors are propelling it. In order to stop at a given point power must be shut off and the brakes applied. To complete the coasting and braking periods of the speed-time curve consider a run of 1200 ft. at a schedule speed of 11½ m.p.h. with a 7.2 second stop. The time required to make such a run will be (1200×3600) / (5280×11.5)=71.2 seconds. This time includes the 7.2 second stop, so that the running time, not including stop, is 64 seconds. An average braking rate of 1½ m.p.h.p.s. was specified. To construct the braking part of the curve, start at the 64 second point on the base line and draw a line through the 15 m.p.h. point at 54 seconds. The slope of this line will then be correct for the braking rate assumed. This line cuts the accelerating part of the curve at *C*. The curve *OABC* is the accelerating portion with power on, *CE* is the braking line and *EF* is the stop.

The Area Under the Speed-Time Curve Is a Measure of the Distance Traveled

The distance which the car travels is most conveniently found by measuring the area under the speed-time curve. To illustrate how this area is a measure of the distance traveled, let us consider one of the cross-section squares. The area of such a square is 2½ m.p.h. × 5 seconds, and if the car could be started instantly at a speed of 2½ m.p.h. and run for 5 seconds and then stopped instantly, the speed curve would be the square *OGHK* and the car would have traveled (2.5×5280 ×5) / 3600=18⅓ ft. Each of these square, therefore, represents 18⅓ ft. As the car is to travel 1200 ft., for this run the area under the speed-time curve must be 1200/18⅓=65.46 squares.

The part of the curve *OAB* with power on, *DE* the braking line and *EF* the stop, are fixed so that the only part that can be varied to get the correct area is the position of the coasting line *BD*. This is first drawn in a trial position and the inclosed area is obtained by counting the squares or measuring with a planimeter. If the area is found too great, the coast line is moved down, and if too small, the line is moved up and this cut and try method continued until the inclosed area is found to be correct.

To determine the slope of the coasting line, take the train resistance for the average coasting speed and compute the rate of retardation from this. In Fig. 3, the average speed for the coasting line *BD* is 14½ m.p.h., the train resistance is 275 lb. per motor and the rate of retardation 275/1178=0.23 m.p.h.p.s., that is, 10 seconds after power has been shut off, the speed of the car will be reduced 2.3 m.p.h. This method assumes that the coasting line is straight, which is not entirely correct, since the train resistance varies with the speed of the car and the coasting line will have a slight curvature. This curvature is so small, however, that no serious error is introduced by assuming the coasting line as straight and the slope drawn to correspond with the train resistance at the average speed.

Selecting and Caring for Hand Tools Used by Way Department

By R. C. Cram

Assistant Engineer, Department of Way and Structure, Brooklyn Rapid Transit System

Tools and Labor Are So Intimately Related in This Department that Good Tools Well Maintained Will Pay for Themselves Many Times Over in Labor Saving Alone

THE constant effort which is being made to effect economies in track maintenance work has caused a searching inquiry to be made into many divisions of the work which in normal times have been subjected to rather superficial and desultory consideration. The subject of small hand tools used by the way department may be placed in this class.

Poor Tools Cause Waste of High-Priced Labor

Ordinarily one would not think it worth while to pay much attention to such matters as tool sharpening, control of supply of tools, overstocking, extra handling and cost of tool supply service. We have all known in a general way that we are using a great many hacksaw blades, or that our picks seem constantly to be on the way to or from the blacksmith shop, but we have not been required to economize because of a lack of an adequate supply of new tools at reasonable prices. Wartime prices for tools and supplies have put these articles upon a higher plane and we are beginning to realize how essential they are. It is brought home to us that we cannot do without the pick and shovel, or the lining bar and spiking maul any more than we can dispense with the men who use them. Consequently the fact becomes evident that it is the very antithesis of economy to pay high prices for labor and then equip it with poor tools. On the contrary, the tools and their condition should receive expert attention with the object of seeing that they are in every way fit to assist in getting full value from the laborers who use them. This point is emphasized by statistics which indicate that more than 60 per cent of the cost of track or maintenance work is spent in payrolls, for labor, and nearly all the time is spent in using tools.



Worn shovels may be easy on the men but are hard on the management

There are also numerous small supplies which are in common use, the consumption of which during a year's work is astonishingly large in quantity. A casual examination of the list of such small things as sandpaper, emery cloth, hacksaw blades, folding rules, lantern and lantern globes, kerosene oil and red flags, which have been used by the average track department in a season, will be an eye-opener to anyone who has not paid much attention to details in this regard.

Before considering either tools or supplies further it will be of interest to inquire into the practice as to the issuing of tools and accounting therefor. In the first place, there should be uniformity in practice and the entire procedure should be carefully outlined. Comparatively simple record systems should be used which will cover the progress of all tools and supplies from the storeroom to the tool box, and thence by monthly checking of the latter until the tools are returned for sharpening or replacement due to loss or breakage and until supplies are exhausted.

Each foreman should be made responsible for the economical use of tools and supplies and for all loss, breakage and misuse. Any extraordinary consumption of tools or supplies, or reported breakage of certain tools, should receive prompt attention with the view of determining whether the consumption may be due not to wear or extra work but to theft or misuse. Continued breakages may mean poor quality of material. Extra large returns of tools for sharpening, particularly from a gang confined to one class of work where use to which tools are put is uniform, should be a cause for study as to whether the tool steel is poor or whether the blacksmith work is being done poorly.

Each foreman should be required to report once a month on the contents of his tool box. The report should be on a printed form of the simplest character upon which are listed all the standard tools, with space for the few odd, little-used tools which are occasionally supplied. Such a form of tool report is shown in Fig. 1 on page 960.

On large city systems it has been found advisable to employ a tool foreman, one of whose duties is to check up the contents of tool boxes at least once a month. When such a man is employed the form of tool record shown in Fig. 2 has been found useful. In addition to this form the one shown in Fig. 4 is used to make a record of delivery for tools and supplies which are handled and consumed in large quantities during each month of a busy season. A similar form is used to make a record of tools picked up by tool cars. These forms serve to protect the foreman and the motormen and chauffeurs who make the deliveries and collections.

A Simple Order System Prevents Loss of Tools

It is not generally good practice to permit foremen to order tools directly, except in case of emergency. They should make their wants known to the roadmaster or supervisor, and no tools should be given out except on proper storeroom order signed by persons authorized to sign orders. A form of storeroom order used for this purpose is shown in Fig. 3. When foremen sign they are usually shop foremen authorized to do so. Also, some roads make a rule that no new tool shall be given

out unless an old tool of like character be returned. This simple rule makes it necessary to account for losses where the old tool is not available for return and tends to create more careful use and to insure return of tools to the tool box at night.

The tool foreman occupies a position of considerable importance. Besides his duty in checking up tool boxes he generally handles the tool requisitions and secures the tools and supplies from the storeroom, sending them out to the various groups either by the regular tool-car service or by auto truck. The proper routing of a tool supply car or truck is no mean task. He also keeps a watch on the tool and supply stock in the storeroom, keeping his superior advised of conditions of stock so that they may be replenished in time to prevent delays to the work.

On moderate sized roads and those having widely separated divisions, the roadmaster generally performs many of the duties of the tool man, acting in direct conjunction with the storekeeper. In such cases tools are usually sent to the job and picked up by regular work cars when making other deliveries.

It is almost imperative that all tools be marked by stamping or branding with some form of distinguishing mark such as the name of the company and the department. Such markings should be done in a manner which will render their removal as difficult as possible, as they serve to prevent theft and interchange with tools of contractors who may have gangs working near truck gangs. For instance, the marking of shovels is of particular importance in some cities where the contractors' custom still prevails of requiring the laborer to provide his own shovel.

The number of different tools used in track work alone is quite large, as will be seen from a glance at those listed for an ordinary tool box in Fig. 2. This list contains eighty different items. Besides special tools not listed there are also the several special tools used by pavers, bonders, special-work repair men, blacksmiths, grinder men and bridge men.

There are at least eighteen distinct tools in regular use by a blacksmith, not including his anvil, forge, water keg and several types of tongs for handling the hot metal. The blacksmith, by the way, is a very important individual in any track organization, not only because of his work in joint repair and preparation of compromise joints in the field but also because of his usefulness in the repair of tools. For these reasons and because of the rather general unfamiliarity with the tools he uses, it is worth while to show them in Fig. 5.

The work of special-work repairmen calls for several special tools, particularly chipping tools for use in resetting hard centers. These are shown in Fig. 6. In addition to these the hard-center gang uses a special torch for heating babbitt or spelter to permit removal of

PUBLIC SERVICE RAILWAY COMPANY

TOOL REPORT

No.	Tools on Hand ... 191 ...	No	Tools Transferred To	Date
	Adze.			
	Adze Handles.			
	Axe Handles.			
	Brace and Bit.			
	Block Pounder.			
	Brick Paving Hammers.			
	Water Pails.			
	Wrenches for 1 inch Track Bolts.			
	" " 1 " " "			
	" " 3/4 " " "			
	" " 5/8 " " "			
	" " 1/2 " " "			

Location of Tool Box at present time.....

I Certify the above to be correct *Foreman*

Approved..... *Roadmaster*

Fig. 1. This Form Is Useful in Reporting Contents of Tool Boxes and Provides a Record of Any Tool Transfers Made

TRANSIT DEVELOPMENT COMPANY

WAY AND STRUCTURE DEPARTMENT

GANG TOOL RECORD

BOX No. TYPE DATE FOREMAN

	Adzes		Drills in.		Picks		Tar Cones
	Augers		Files—Hand		" Tamp.		" Pourers
	Axes		" Rail		Plows		Tarpaulins
	Barrels—Water		File Holder—Rail		Punches—Center		Tie Rod Square
	Bars—Claw		Frames—H.S.		" Track		Tongs—Rail
	" Lining		Gauges—Track		" Thread		" Timber
	" Tamping		Hammers—Track		Rammers—Sand		Wrenches—Hxd
	Beaders—Rail		Hoes		" Paving		" Monkey
	Boots—Rubber		Hooks—Grass		Rasps		" Stillson
	Brooms—Switch		" Timber		Ratchets		" Track
	" Corp. Push		Hose ft.		Reamers		Wheelbarrows
	Brushes—Wire		Jacks—Track		Rules—6 ft.		
	Cars—Hand		" Wrecking		Saws—X-cut		
	" Push		Lanterns		" Hand		
	Chains		" Signal		Scythes		
	Chisels—Cold		Level—Boards		Shovels—T.		
	" Track		" Pocket		" L.H.		
	Compressors—Bond		Lights—Clusters		" Scoop		
	Dippers—Tar		Mattocks		" Wood		
	Drills in.		Mauls—Spike		Sledges		
	" in.		Oilers—Steel		Squeegees		
	" in.		Oil—Men		Tapes—Linen		
	" in.		Pails		" Steel		

Fig. 2. A Convenient Form for Recording the Tools in Use by Different Gangs

Form N. S. 375 TRIPLICATE

T. D. CO. Storeroom Order 39th ST. STOREROOM Date ... 191...

Supplies chargeable to one account only to appear on same order. Book No. 4966 Order No. 18

Quantity	Unit	DESCRIPTION	Bin No.	Price	Amount

SPOILED ORDERS MUST BE TURNED IN TO STOREROOM
ACCOUNT AND AUTHORIZATION NUMBERS MUST BE SHOWN

TOTAL

Account No. ..... M S O No. ..... Request No. ..... Authorization No. .....

Where used .....

Fig. 3. This Form Is Used for Drawing Supplies from the Storeroom and Prevents Use by Unauthorized Persons

TRANSIT DEVELOPMENT COMPANY

WAY AND STRUCTURE DEPARTMENT

DATE

FOREMAN MOTORMAN CHAUFFEUR

LOCATION

MATERIAL, TOOLS, DELIVERED TO GANG

FOREMAN SIGN HERE TIME RECEIVED

Fig. 4. Delivery of Tools and Supplies Can Be Effectively Recorded by Means of This Form

GROUP OF RECORD FORMS FOUND USEFUL IN THE WAY DEPARTMENT

centers, and another for heating these metals preparatory to pouring them around the centers.

Lists of the general run of track tools are given in the gang tool records shown in Figs. 1 and 2. Each gang should have a complete outfit of standard tools in sufficient number to supply every man in the gang. Extra tools and parts are also required to take the places of those which break or which must be sent to the shop for repair. Where the gangs are in cities, close to sources of supply, but a few extra tools need be carried, as those needing replacement can usually be exchanged quite readily. The section gang which is liable to be a long way from supplies naturally needs to have some extra tools to fill in until replacements can be made.

The equipment of gangs will vary considerably, depending upon the size of the gang, upon the general nature of the work, and upon whether the gang is a section gang employed upon T-rail only or whether it may be employed on girder rail in paved streets.

Special Tools Need Special Handling

The list of tools given in Table I is indicative of the average equipment for city gangs of (1) sixty men on construction work; (2) of ten men on repair work, (3) of sixteen to eighteen men on special work; and (4) of six men on section work on T-rail track. The list covers certain conditions and will be varied by roadmasters more or less in accord with local practice. For instance, roads having several divisions will be found to have at least one electric track drill as a part of each roadmaster's tool equipment. On the other hand, some large city systems prefer to control these machines from headquarters, sending them from gang to gang as occasion warrants, usually by auto trucks. Again, snow shovels are kept at headquarters and distributed only in the winter season. Even then but few gangs carry more than a half-dozen or so because it is necessary to provide hundreds of them during big snowstorms when gangs are rapidly increased for such emergencies and large numbers of shovels can best be stored and distributed from headquarters.

It is not the custom to provide all gangs with rail benders or jim crows. These are usually kept at headquarters and sent out, as needed, by the roadmaster. Exception is made at times to this rule for particular special-work gangs and section gangs which have to cover a large yard of T-rail track. Where a section gang has rock cuts on its portion of the line, slides are liable to occur. Such a gang must have rock drills, striking hammers, powder and fuse for emergency use.

Small Tool Standardization Has Several Advantages

The importance of having all gangs equipped with one style of each tool is worth noting. This is particularly advantageous because it allays any petty jealousies which may develop between gangs through real or fancied superiority of one style of the same tool (jacks, for instance) over another. Furthermore, if gangs are doubled up in emergencies there will be less tendency for borrowing the other fellow's good tools and returning poorer tools in their places.

It is very desirable to have standard plans of all tools. These plans will be found of great value in purchasing and inspecting them. If the making of such plans appears burdensome or unnecessary it is still possible and worth while to select them by number or description from the catalogs of the reliable supply houses and always to order the same makes and styles of those tools known to be most efficient. Standard plans of tools have another use in furnishing details for the repair and local manufacture of tools such as level boards and track gages. The standard tool plan shown in Fig. 7 is made up upon a sheet 4 in. x 6 in. with a 1-in. margin at one end for binding in loose-leaf book form.

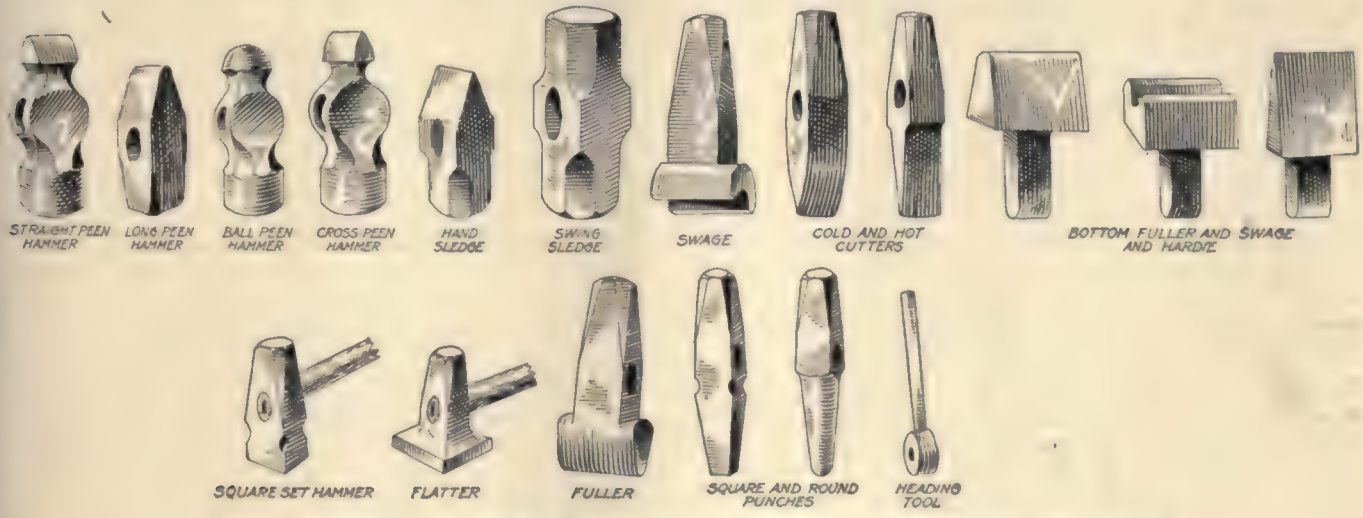


FIG. 5. THE WAY DEPARTMENT BLACKSMITH USES A WIDE VARIETY OF TOOLS

Specifications for Tool Steel Are Important

In the selection of tools made of steel, more attention should be paid to the quality of the steel and its suitability for the work. The steam roads have given more study to this than the electric roads. For instance, the Pennsylvania Railroad has its picks made of open-hearth steel having from 0.55 to 0.75 per cent carbon, not more than 0.04 per cent each of phosphor and sulphur, and about 0.40 per cent manganese. Similarly its track chisels and track punches are made of crucible steel

having from 0.80 to 0.90 per cent carbon, not more than 0.04 per cent each of phosphor and sulphur and 0.30 to 0.40 per cent manganese.

The further advantage of study of the proper quality of steel for track-tool use is illustrated by the experience of one electric railway which found in 1915 that it could substitute "Black Diamond" crucible steel at 7½ cents per pound for Jessup tool steel at 16 cents per pound and secure equally good results from tools, such as pick points, track chisels and punches, made therefrom. The saving thus effected amounted to a considerable sum in the course of a year.

The Shovel Question Will Bear Investigation

Again, the quality of steel in track shovels will bear attention, especially where the men are required to furnish their own shovels, although this practice is considered poor policy. The usual effective depth of a shovel blade is about 10 in. An inch of wear reduces its capacity nearly 10 per cent. Men have been known to take shovels off the job and deliberately have them cut down an inch or so in order to lessen the labor of using them.

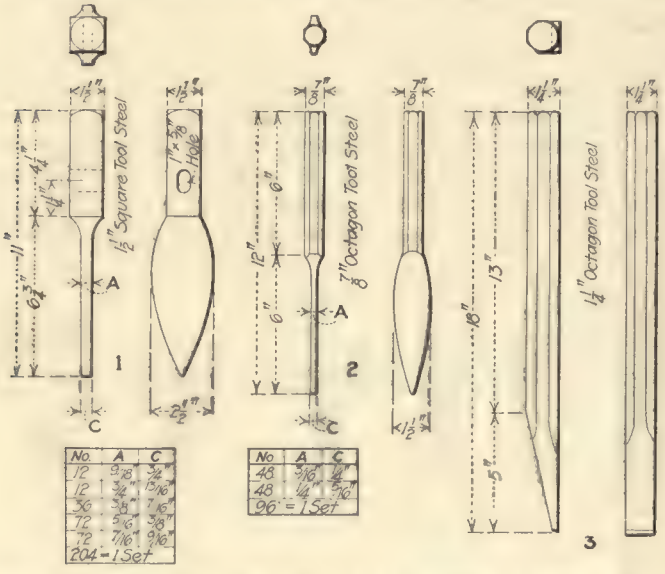


FIG. 6. THESE CHIPPING TOOLS ARE USED IN RESETTING HARD CENTERS

When a man furnishes his own shovel he will naturally buy the cheapest he can find. He will use it just as long as there is a plausible remnant of the blade left unless required to discard it after a certain wear is reached. He will not drop his shovel to do other work but will walk 500 ft. or more to his coat and hide it. He thus consumes the employer's time without result. The operating cost of a shovel is at least $2 per day. If the man is permitted to use a shovel of half the full blade length the operating cost is the same but the efficiency is decreased by one-half.

Shovels are abused by being thrown about carelessly, by having heavy tools and materials thrown upon them and by being driven into ties to pull the latter about under the rails. Only the best grade of steel will long withstand the lack of care and heavy duty thus imposed.

A shovel of fair-looking quality may be purchased for 40 or 50 cents but a shovel made from an alloy steel of exceptionally good quality may be had for 90 cents or so, and this will out-wear the cheaper shovel at least four or five to one. The introduction of special grades of alloy steel in shovel manufacture has again proved the value of selecting the best of steel for tool uses.

Worn and Broken Track Tools Can Be Repaired Profitably

The cost of new track tools has steadily increased to such an extent that the subject of the repair of worn and broken tools has become one of considerable importance. The general procedure has been very well described in an article in the ELECTRIC RAILWAY JOURNAL for March 25, 1916, from which much of the following is taken.

Ordinary track hand tools, as a rule, are not reclaimed when they become badly worn or broken, and only such repairs are made as can be readily handled by an ordinary laborer. This is particularly true of large construction jobs where a considerable item of their cost is expended in track hand tools; yet when a job is completed comparatively few of the tools are found to be good enough to turn over to the maintenance forces. Many of these worn and broken hand tools, which are discarded as useless, can be repaired profitably. Experience on some roads has demonstrated this fact, and the ease of making repairs has been considerably facilitated by the introduction of portable welding outfits. While it has been found economical to repair tools, it is also very important that the repairs be properly made to accomplish the best results. It is as essential to good workmanship and efficiency that tools should be kept in proper condition as it is to buy first quality tools. In other words, tool repairs should be concentrated at a single point where one or more men may be regularly employed in putting them in serviceable condition.

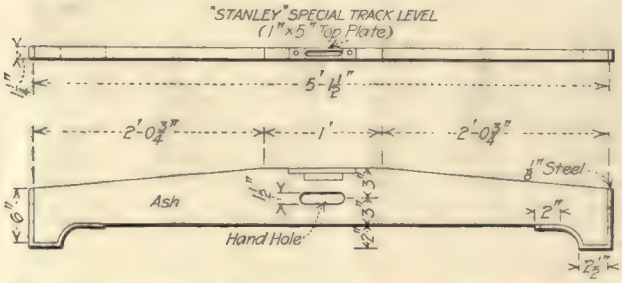


FIG. 7. A SAMPLE STANDARD TOOL PLAN FOR THE LOOSE-LEAF NOTEBOOK

A first-class blacksmith is best qualified to do this kind of work, but it must be borne in mind that not every blacksmith can repair these tools. Experience in making repairs to hand tools is a necessary requisite, hence it is better to employ one man on work of this kind and hold him responsible for the quality of the repairs made.

New Handles Can Be Put on Old Shovels

Specific cases of repairs to hand tools that pay include reclaiming good shovel blades, in which the handles have been broken, by supplying new handles. Handles in good condition may often be had by taking them from blades that are completely worn out. Another method consists in supplying a new cast-iron D-handle to replace wooden D-handles. Such a casting is shown in Fig. 8. These cost about 16 cents each.

Claw bars badly worn, or with one of the claws broken, may be reclaimed by dressing the bar down to form a new claw, or if there is not sufficient stock remaining, a new claw may be welded on. It is also important, and has now become general practice, to keep picks sharp and properly tempered. The cost of the pick was once considered so small that reclaiming the old one was not worth while, but it is now considered economical to do so by welding on new points as needed. Lining bars and tamping bars may be readily restored to good condition by straightening, redressing and tempering.



FIG. 8. DAMAGED D-HANDLES OF SHOVELS CAN BE REPLACED WITH IRON ONES

Accurate Jack and Drill Repairs Pay Handsomely

Accurate workmanship when repairing spike mauls is very important. An untrue surface makes it impossible to strike a true blow, and an improperly struck blow may bend a spike or cause an accident. An improperly tempered maul soon becomes untrue when the metal is too soft, or if it is too hard pieces map chip off and cause an accident. The same requisites apply to track chisels which primarily must be purchased with steel of proper quality. A poor chisel delays the work and increases the cost of any operation. It is also very important to keep track jacks in perfect operating condition. Where several extra ones are not on hand a bad-order jack may tie up a gang. The track jack, like the track drill, is more expensive than the average hand tool, and it is not general practice to have an unlimited supply of extra ones. It is therefore important that jacks and drills not only be in good order but that they be inspected for defects occasionally, and when repairs are necessary they should be made by an expert mechanic in order to insure results. However, drill bits may be accurately sharpened on the job by the average laborer if the gang tool box is supplied with a Keystone tool grinder.

With no other track hand tools are accuracy and good repair so important as with the usual track gage and level. When these become damaged for any reason the utmost care should be exercised to see that the repairs are made properly, and after the work is completed their accuracy should be checked before they are actually used in track work. Repairs to either of these tools are difficult to make because accuracy is so essential, hence it is especially advisable to have this work done by an experienced repairman. In other words, the repairing of most track hand tools is a job for a specialist if the best results and maximum economy are to be obtained.

Repairing 10,000 Picks at Six Cents Each

As an indication of the comparatively small cost for tool sharpening and repair, it will be of interest to note that the records of one railway covering repairs to picks, lining bars and track jacks for one season show that more than 10,000 picks were repaired at a cost of about 6 cents each, while 6900 lining bars were restored to service at an average cost of 5 cents each and 186 jacks were refitted for service at a cost of 70 cents each. The records further indicate that each jack went to the shop five times during the season. The type of jacks used in

TABLE I. STANDARD LIST OF TOOLS FOR TRACK MAINTENANCE GANGS OF SEVERAL SIZES

Tools	Construction Gang 60 Men	Repair Gang 10 Men	Special Work Gang 16 to 18 Men	Section Gang 6 Men
Adzes	2	1	1	2
Axes	1	1	1	1
Bars—Claw	5	1	6	3
Bars—Lining	20	8	12	4
Bars—Tamping	20	8	12	4
Benders—Rail (furnish as needed)				
Boots (furnish as needed)				
Brooms—Switch	4	1	4	3
Brooms—Corporation Push	3	2	2	2
Brushes—Wire	2	1	1	
Cars—Hand				1
Cars—Push	1			
Chains	2		2	
Chisels—Cold	2			
Chisels—Track	20	8	20	2
Chisels—Asphalt	6	2	2	
Compressors—Bond	1	1	1	1
Dippers—Water	2	1	1	1
Drills—⅞ in. (minimum number)	4	4	5	4
Drills—1¼ in. minimum number)	4	4	5	2
Drills—1 in. (minimum number)	4	4	5	2
Drills—⅞ in. (minimum number)	4	4	5	2
Draft pins	4	4	3	
Files—Hand—Round	1	1		
Files—Hand—Flat	1			3
Files—Hand—Rail	1	1	1	
File holder—Rail	1	1	1	
Flags (furnish as needed)				
Frames—Hacksaw (at least 1 doz. blades to each frame)	4	4	6	2
Gages—Track	2	1	3	3
Gages—Wood (insulated)				1
Grinder — Keystone tool	1	1	1	1
Hoes	4	1	2	
Hooks—Grass				2
Hose—Rubber	100 ft.	15 ft.	30 ft.	
Hydrant connection	1			
Jack—Track	6	2	5	3
Jack—Wrecking	2		1	1
Jim Crows				
Lanterns	50	12	35	15
Lanterns—Signal				3
Level—Boards	1	1	2	1
Level—Pocket	2	1	2	
Light clusters				
Mattocks	1		2	1
Mauls—Spike	8	4	8	4
Oilers—Steel	1		1	
Old men	2	3	2	2
Parls	6	2	4	3
Picks	20	8	16	10
Picks—Tamp				4
Pipe—Water	250 ft.			
Plows				
Punches—Center	2	1	1	2
Punches—Track			5	
Punches—Thread	2	2		
Rammers—Sand	6	2	4	
Rammers—Paving	1	1		
Rasps			3	
Ratchets	4	3	6	2
Reamers	2	2	8	
Rules—6 ft., folding	1	1	1	1
Saws—Crosscut	1		2	1
Saws—Hand	1	1	1	1
Scythes				2
Shovels—Track sq. pt.	20	6	10	12
Shovels—L-H				4
Shovels—Scoop	8			4
Shovels—Wood				2
Sledges	10	3	10	1
Spike pullers			2	1
Tongs—Rail	12	4	10	8
Tongs—Tie				4
Tapes—Linen			1	1
Tapes—Steel	1	1	1	1
Tarpaulins	1		1	
Tie Rod—Square	1	1		1
Wrenches—Hydrant	1	1	1	
Wrenches—Monkey	1		1	1
Wrenches—Stillson	1			
Wrenches—Compressor	1	1	1	1
Wrenches—Track	10	4	12	6
Wrenches—Tie Rod	4	1	4	1
Wheelbarrows	6	3	6	2
Water barrels		1	2	

this instance cost $8.35 in 1914, hence it is beyond question that the repair was economical.

The cost of tools, supplies, repairs and delivery service varies greatly. Much depends upon the size of the road and its characteristics, particularly as to whether it be a city property with much pavement or a road operating largely in private right-of-way. Furthermore, if a large amount of reconstruction is undertaken in any one season, the cost for tools and supplies will increase accordingly. Consequently there is no measure by which the tool expenses of one system may be safely compared with another. Nevertheless it is worth while to keep track of these expenses with the purpose of being sure that they do not get out of bounds. It may be of interest to state that the cost of tools and supplies may run as high as $100 per mile of single track per year in a busy season, if the costs listed in Table II from the tool accounts for 1917 of a 550-mile city property can be taken as a guide. (The year 1917, by the way, can be considered a very "light" year due to sharp decreases in amount of work done).

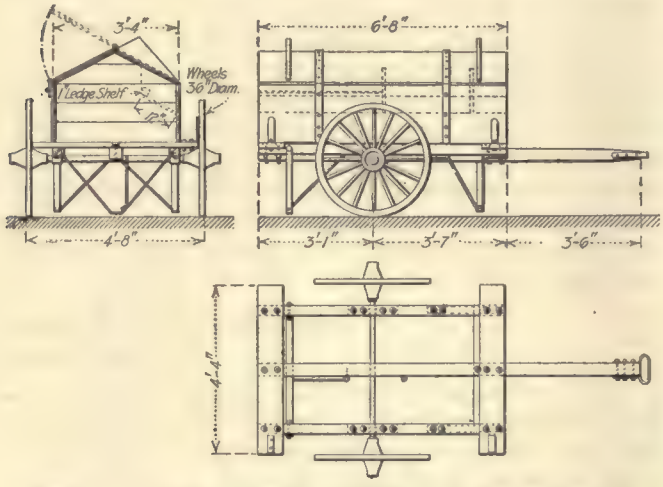


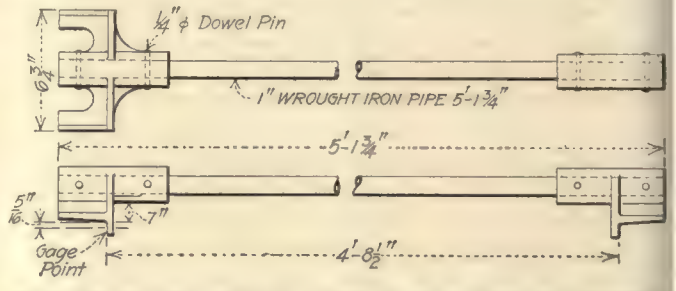
FIG. 9. A TOOL WAGON WHICH CAN BE MADE AT REASONABLE COST

Small tools and supplies, it will be noted from Table II, account for the larger portion of the tool and supply service. The supply list reads like a stock sheet of a regular hardware store, and everyone knows that small hardware is expensive.

Some of the cheapest things that are used cost a great deal in the aggregate. Lantern globes, for instance, are comparatively cheap in first cost but they are consumed in large quantities. White globes are worth about 6 cents each, while red globes cost about 20 cents each. In city work red globes are used to a much greater extent than white ones. The difference in cost on one property led to an important economy through the use of white globes dipped in a special red coloring preparation. This preparation could be purchased before the war at $3 per gallon. It is now worth $8.75 per gallon. Under these conditions the tool foreman rose to the occasion and consulted with the boss painter who made some experiments and finally produced a red color at a cost of $2.75 per gallon. This holds its color even better than the material formerly purchased and also covers more globes per gallon of color. The former color covered about 350 globes per gallon while the new color covers about 500. This color is made from the following formula: 3 lb. deep permanent red, No. 171 dry, St. George Chemical Company, 25 cents per pound; 1 gal. bronze liquid, $1.75; labor to mix, 25 cents; total, $2.75 per gallon.

Similarly, when the price of high-speed drill bits rose skyward the tool man set about using the arc welder for repairing broken bit shanks and began to get the fullest possible use of the bit points by welding on an added length of shank.

A study of the consumption of kerosene oil on one road recently developed a discrepancy of over 30 per cent between the amount of the oil which should be used for the number of lanterns in daily service and that actually drawn from stock every day. This led to the discovery that some of the oil was going to the homes of the men by devious routes, particularly during the period when oil became very scarce and high in cost. It was also found that there was much waste due to the method of distribution; to carelessness in filling lanterns; to leaky containers and to leaky wells in the lanterns. These discoveries naturally led to a radical change in the whole procedure and effected a large saving.



THIS STANDARD TRACK GAGE IS FOR USE ON TRACKS WITH GUARD RAIL

TABLE II. EXPENDITURE FOR ROADWAY TOOLS AND SUPPLIES SEASON OF 1917, ON A 550-MILE CITY RAILWAY SYSTEM

Total expenditure for 1917	$48,000 00
Average monthly expense	4,000.00
Cost of tools and supplies	30,100.00
Cost of tool-car service	10,600.00
Cost of tool repairs	7,300.00
Cost per mile single track—tools and supplies	$54.70
Cost per mile single-track—tool-car service	19.30
Cost per mile single track—tool repairs	13.30
Cost per mile single track—total	$87.30

NOTE—Tool-car service was furnished by two tool cars at a charge of $25 per day per car. Tool repairs include repairs to large machines, such as mixers, grinders, arc welders and electric drills.

Good Tool Houses and Tool Boxes Help in Tool Conservation

On long interurban lines, the track tools are usually kept in section tool houses similar to those used by steam roads, in which case the tools are transported on the section hand cars. The latter are being displaced by gas-driven cars which have many advantages. Where the section is comparatively short or runs out from city or other headquarters, the tools and the section gang are more apt to be transported upon a regular motor flat car, which may remain on the job at the nearest siding during the day. In such cases the car is available for hauling ballast and other needed materials.

It is not practicable in city work to maintain tool

(Continued on page 965)

Steel Car Body Is Well Adapted To Resist Unusual Stresses

By Norman Litchfield

The Roof, Posts and Carlines, Side Girder and Underframe All Combine to Make a Box Girder of the Modern Car, a Form of Mechanical Structure Which With Minimum Weight Will Give the Requisite Resistance to Shock

IN THE writer's recent article on types of side frame construction it was pointed out that side frames in general could be divided into four classes: (1) sill and truss rod; (2) fish-belly girder below floor level; (3) side plate girder formed by sill, belt rail and sheathing; (4) truss formed by side sill as bottom member, side plate as top member, and window and door posts as verticals, the place of ordinary bridge truss diagonals being taken by the sheathing and the resistance to cross-bending of the posts.

Center Side Doors Impose Special Design Problems

Where center side doors are used, a modification of the plate girder is sometimes resorted to, this consisting of a patching or splicing of the two halves of the girder either by a short fish-belly girder under the door or a stiff rectangular frame around the doorway. In the latter case the center-door posts are subjected to severe bending strains, and it may be of interest to study some points in connection therewith.

From the bending moment diagram for the case cited in the previous article, the stress in the top and bottom chords at the doorway is seen to be 8571 lb. The figure on page 966 shows diagrammatically the frame members and the stresses, the assumption being made first that the frame is strictly rectangular and, second, that the rivets at the top connection of the post to the side plate are fairly close together so that the top corner may be said to approximate a pin joint in a true truss.

The doorpost then becomes in effect a beam supported at the ends A and B with a concentrated load of 24,000 lb. applied at the belt rail C. Hence the maximum bending moment is at the belt rail and amounts to $8571 \times 54 = 462{,}834$ in.-lb. requiring, for a fiber stress of 16,000 lb. per square inch a section modulus of 28.92. This is the equivalent of a standard 12-in. 35-lb. rolled channel. This section has a flange width of 3.3 in. and, as is pointed out in the handbook of the Cambria Steel Company, "in order to prevent undue strains in the compression flange, considered as a column, the beams should be supported laterally at distances not exceeding twenty times the flange width, this ratio being determined by the following formula, which gives the safe load for solid columns of soft steel:

$$p = \frac{18{,}000}{1 + \frac{l^2}{3000b^2}}$$

in which

p = allowable stress in pounds per square inch.
l = length between lateral supports in inches.
b = width of flange in inches.

Substituting 16,000 for p in the above formula it is found that the ratio $l/b = 19.37$, from which it may be seen that the compression flange should be supported laterally at distances not exceeding twenty times the flange width as stated above."

To follow this practice with the channel in question would require it to be supported sidewise at a distance of 66 in. between supports. While it is possible to brace the striking post sideways by a diagonal from the floor frame it is obviously impossible to do so on the pocket side as the door has to slide past the post in opening.

As the post is 84 in. long, the only resort is to the reduction in the fiber stress. Substituting in the formula $l = 84$ in., and assuming still a flange width of 3.3 in.,

$$p = \frac{18{,}000}{1 + \frac{84^2}{3000 \times 3.3^2}} = 10{,}514 \text{ lb. per square inch.}$$

This would require a section modulus of 44 or a 15-in., 40-lb. channel.

(Concluded from page 964)

houses, and as a substitute each foreman is usually supplied with a tool box or a tool wagon. These should be substantially made and must be provided with exceptionally good locks. The tool boxes are moved from job to job by work cars, usually at night, so as to be ready on the new job when the gang arrives in the morning at a new location.

The tool wagon has the advantage of portability as it can be moved by the men if necessary; it can be towed behind a motor truck or work car, and it can be quite easily loaded upon a work car by the men if skids are provided. A form of tool wagon is illustrated in Fig. 9.

Tool boxes should not be made too large in size with the view of getting all the tools for a gang of fifty or sixty men into them. Where this is attempted it will be found that it is practically impossible for the men to lift them when loaded and it requires a derrick to place them upon cars for transportation. In consequence the box must often be unloaded and loaded upon the cars when empty, which necessitates much rough handling of tools, greatly increasing breakage and consuming valuable time as well. It is far better to provide two or three boxes of moderate size, each suitable for the average sized repair gang of say twelve to twenty men.

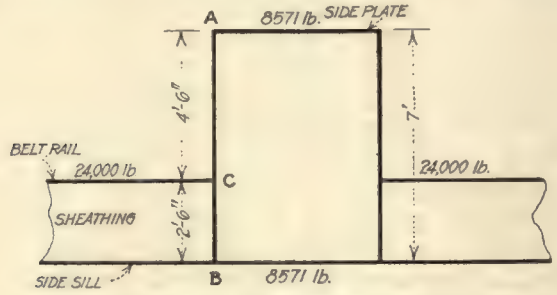
Where tool boxes are used it is customary in city work to keep a watchman at the box at all times. He keeps track of the tools, fills lanterns and puts them out on the work and he can make himself useful in sharpening tools on the portable tool grinder. The use of the watchman should not relieve the foreman of his responsibility for the tools and their fitness for service.

This is a heavy section and it is not always possible or desirable to use as great a width as 15 in. for a door post. Further study is therefore required for the most desirable post construction.

Assuming that it is desired to keep the width within a maximum of say 12 in., and the depth 3½ in., the possibilities of increased section modulus consist in the use of a built-up beam of heavy angles riveted to a web plate or box section pressed from steel plate. But the post even so remains undesirably heavy.

Saving Steel in Offsetting Effect of Side-Door Frame

In the foregoing calculations we have assumed throughout that the post was to be considered as a beam loaded at one point, the belt rail, and supported freely at each end. With regard to the lower support this assumption is not entirely fair inasmuch as the post is riveted to the sill and to the side sheathing all the way from the sill to the belt rail and, therefore,



FRAME MEMBERS AND STRESSES IN CENTER SIDE DOOR CONSTRUCTION

so far as the lower support is concerned, the post may be considered as a fixed beam. By special construction, such as making one flange of the built-up post a continuous piece from sill to side plate and back to sill again, thus forming an arched doorway, and providing a stiff web plate overhead riveted securely to the vertical webs of the posts, the condition of a beam fixed at both ends is approximated and the bending moment is thereby reduced one-half. This makes possible the use of a much lighter section, and the construction adds to the general stiffness of the structure and gives good results.

Instantaneous Braking Rate May Reach 15 m.p.h.p.s.

Another consideration which enters into the design of the side posts is the bending strain to which they are subjected by the fore and aft lurch of the roof in starting and stopping, and more particularly in coupling up to another car. As already pointed out, the amount of any such force is equal to the product of the mass by the acceleration.

Repeated observations of high-speed braking rates indicate that the maximum rate of retardation is somewhere about 8 m.p.h.p.s., making it probably safe to assume for ordinary running service a rate of from 12 to 15 m.p.h.p.s. The stress figured on this basis should be added to the working stress calculated as already outlined. In coupling up, this rate will, of course, be considerably higher, the exact amount depending upon the handling of the car by the motorman and the design of the spring draft gear. These stresses occur, however, only with empty cars. They are of short duration and so do not need the same consideration as those induced by regular service operation.

The effects of these stresses are very noticeable in many old wooden cars which were built with a very heavy roof, and with the window posts cut nearly in half at the window sill in order to let the rails set in flush with the face of the post. With steel construction their effects are less noticeable, as ordinarily the sections used for window and door posts are necessarily of such depth that they automatically provide sufficient strength to resist this lurching.

Much ingenuity has been shown in the development of window posts and appliances, the merits of which cannot be discussed here. The fundamental choice is between the use of some standard rolled shape, such as a T or an angle, with wooden or steel moldings bolted thereto, and a pressed box section either with moldings or pressed from one piece. The pressed section gives the better section modulus, but on the other hand the standard section has advantages, which to some designers have appealed more strongly than the feature of strength.

The Steel Roof Had an Independent Structural Function

Practically all of the earlier types of cars were built with the so-called monitor deck, familiar to everyone. This was designed primarily to give ventilation through the use of windows set in the walls of the upper deck, which were sufficiently high above the heads of the passengers to permit of their being opened without any great discomfort.

The desire for a simpler, lighter and cheaper car construction led later to the use of the plain arch roof, with special ventilators of one type or another designed to exhaust the air from the car, fresh air being furnished either through special intakes or through the opening of doors and leakage around windows and doors.

A third type of roof is that developed by the designers of the Howe truss side frame, before mentioned, in which a sort of secondary arch is sprung from what would be the deck sills of the ordinary monitor roof. This construction gives an interior which is free from any projections to catch dirt, and at the same time it provides great stiffness and preserves the appearance of height in the interior of the car, which to some extent is lost in the plain arch roof car.

The use of steel members for the roof framing started with the first steel cars, but it was not until somewhat later that steel sheets were used for the roof itself. A little consideration will show this added very largely to the stiffness of the car, as the roof thus forms a sort of tubular structure which in itself is a girder capable of carrying considerable load. The roof also ties the two side trusses together, making together with the floor and end framing a complete steel box which is so stiff that it can be jacked up at one corner with practically no distortion.

The question of the desirable strength for the carlines is covered in the postal car specifications referred to in a preceding article, the main provisions being as follows:

"The projected area of the portion of roof in square feet supported by carlines divided by the sum of the section moduli of the carlines must be not more than 100."

In using the above as a guide it should be remembered that these specifications were drawn up to cover the severest kind of high-speed service, and that therefore it is perfectly permissible to deviate therefrom for less severe features after careful study and analysis of the existing conditions has been made. On the other hand, special conditions, such as trolley pole supports, will require even stronger construction. The specification quoted is therefore cited merely as a guide or basis from which to work out the necessary design.

In the carline construction three general types have been followed. Nearly all of these are covered by patents, a statement which is also true of many of the detail points of construction already mentioned. It is the writer's purpose throughout this series of articles to point out the general underlying principles of construction, citing such examples as may throw light on the general subject, regardless of the patent situation.

The three types of construction are: (1) The combination of window posts running from the side sills to the side plates and carlines of rolled or pressed sections running from the post on one side to that on the other, the posts thus acting as abutments on which the arched carlines rest. This construction applies to both the monitor deck and the plain arch roof, and is in general use. (2) In an arch roof, a post running continuous from side sill to side sill, forming its own arch carline. This construction has been largely used on the one-man cars referred to by the writer in previous articles. (3) The use of a post running straight from the side sill to the side plate and then bent over to follow the curve of the lower deck to the point of the monitor deck sill. On the ends of these cantilever posts rest castings which support the short carlines of the upper deck. This construction is that of the Pennsylvania Railroad in some of its trunk line coaches.



What a Joy There Is in a Well-Designed Car

What Is the Best Joint for Steel Roof Plates?

Reference has been made to the increasing use of steel plate for the roof. The chief difficulty encountered in its use has been that of making satisfactorily tight joints at the splices and the eaves. In the earlier cars the designers resorted to the use of sheets tinned or leaded at the edges. The sheets were riveted to the roof member and then the joints were soldered. While this practice provided the desired degree of watertightness, the sweating of the joints proved a slow and expensive matter. Some trouble has also been experienced from the corrosion of the sheets along the lines marking the division between the tinned and untinned portion of the sheets. This is due either to corrosive action of the original soldering flux or possibly to some electrolytic action. This method has now been largely discarded, the choice at present lying between a flame-welded joint and one formed with a gasket of heavy building paper of special type laid between the two metal parts, cold-driven rivets being employed therewith. The welded joint is probably the more desirable but has the obvious disadvantage that it is difficult to remove any one sheet which for any reason has become corroded or otherwise damaged. It is also a rather expensive process and for this reason the gasketed joint has received considerable favor. The latter has been in use sufficiently long to give good indications of its general serviceability.

It's the Car End That Takes the Buffing Stresses First

Our consideration of the various parts of car construction now leads us to a very important part, namely, the end construction. For high-speed trunk-line service we may again turn to the postal specifications, a quotation from which has already been published in a previous article. For convenience, however, it may be repeated that for electric cars where the weight of the train does not exceed 600,000 lb. it is required that the sum of the section moduli of the vertical end members shall not be less than 40, and the section moduli of the main members either forming or adjacent to the door posts shall be not less than 75 per cent of this amount.

Here again it should be borne in mind that for ordinary electric service the weight of trains above referred to is considerably greater than is customary, and for that reason due allowance may be made in the design to suit the known conditions.

To resist end blows resulting from collisions it is necessary to give consideration to the climbing effect of one car over the other. That is to say, it would be comparatively simple with the average light electric car to provide against collision effect if the floor frames met exactly in line and remained so, but unfortunately it is a familiar fact that one car practically invariably slides upward on the face of the buffer of the other car and then travels forward over the floor frame. This therefore requires either very heavy post construction as provided for in the postal car specifications or some means for preventing the sliding of one car upon the other.

This tendency to climb has been met either by the use of heavy castings set back of the buffer tending to interlock if one car climbs the other, or else by the use of transverse ribs on the face of the buffer forming channel-shapped grooves which interlock and prevent climbing. Such have proved their worth, especially in the minor collisions which are apt to occur in handling cars in storage yards.

Other means which are taken to minimize collision effects are to provide a cushioning feature, such as a wooden block back of the buffer face, or else purposely to design the steel construction of the floor to collapse slightly just back of the buffer. In this case the final shock is resisted by wide plates, known as anti-telescoping plates, set edgewise and riveted to the sills. Such plates serve to bind all the sills together and to distribute the end shocks equally among the latter.

These features are exclusive of the special spring buffing devices in general use on trunk-line service, and the use of which are not usual on cars for electric service.

Zone System for the Distribution of Bituminous Coal

By order of the Fuel Administration, the distribution of bituminous coal for the year which began on April 1, 1918, will be controlled by a zone system, which is intended to reduce the burden on the railroads, facilitate shipment of coal and keep all the mines working at full capacity. The insert map which accompanies this number shows the zones into which the country has been divided for this purpose.

THE factor that loomed largest in the fuel crisis of last winter was the lack of adequate transportation facilities. Under the plan of distribution then followed, a consumer in any part of the country was free to order his coal supply from any producing district, regardless of the length of haul involved. As a consequence, it often happened that cars and locomotives were engaged in delivering coal to distant regions that could have been served far more quickly from fields near by.

Obviously, this complete freedom of choice as to the source of coal used led to cross-hauling in addition to the utilization of railroad equipment in unnecessarily long hauls, the result being a great waste of transportation power. To prevent this needless waste and make possible an increased production to meet the war demands, the United States Fuel Administration, in conjunction with the Director General of Railroads, has announced a zone system for the control of bituminous-coal distribution for the year which began on April 1, 1918.

The zone system was adopted only after prolonged conferences with coal producers, jobbers and consumers, as well as with the traffic and operating officials of the railroads. Briefly explained, it divides the country into a number of zones, each of which must obtain its coal supply from mines that are relatively near, thus preventing abnormal and wasteful transportation movements and insuring more nearly equal distribution of cars to the mines and more steady employment of mine labor.

Of course, so radical a change in the methods of conducting the coal business will cause some inconvenience to producers and consumers and will involve additional expense in some cases. For example, the producers of Pocahontas coal may no longer ship their output to Chicago and Western points by rail; instead, they must find new markets in the East. Those plants in and around Chicago that have been burning West Virginia coal will be compelled to substitute Illinois coal, which can be obtained with less than half as long a haul. As the two fuels are of very different characters, changes in the boiler settings and methods of firing will have to be made, which will entail expense.

It is the hope of the Fuel Administration, however, that the consumer and the producer will bear these unavoidable inconveniences in the realization that the readjustment of the distribution of coal is for the welfare of the nation. In other words, they are appealed to on the grounds of patriotism.

There are exceptions to the conditions imposed by the zone system. Certain industries require coals of particular quality or characteristics, as, for example, byproduct, gas, blacksmith and metallurgical coals. If a consumer needs coal of one of these kinds and is unable to obtain it from the producing districts that are permitted to ship into the zone in which he is located, permits will be issued to allow the special-purpose fuel to be brought in from other districts.

The zone system does not affect the following bituminous coal:

1. Coal for railroad fuel, for which special arrangements will be made by the Fuel Administrator and the Director General of Railroads.
2. Coal for movement on inland waterways, which is in no way restricted by the system.
3. Coal delivered to Canada, which is subject to regulations of the Fuel Administrator.

To enable the consumer of bituminous coal to determine the districts from which he may obtain his fuel and to show the producer the zones in which he may sell his output, the accompanying map has been prepared.

It will be seen that the entire territory of the United States has been divided into a large number of irregular zones or sections, colored differently so that they may readily be distinguished one from another, and each marked with a key number. Each of these separately numbered zones has certain definite boundary lines and is restricted to the use of coals from certain districts. The Key to Consuming Zones gives a complete list of all the zones shown on the map and states the districts from which they may obtain coal. The zone boundaries when not state lines are usually through route steam railroads. These railroad lines are lettered on the insert map.

If an electric railway company wishes to find out what coals are available for its use, it should find from the map the zone in which its power station is located and note the number of the zone. Then, in the Key to Consuming Zones, under that zone number, will be found the list of producing districts from which coal can be obtained. Following this key is a list of the meanings of the terms used in the key, such as "summer" and "winter" and division of states.

The Key to Producing Districts is intended to show the producer the several zones in which he may market his product. He knows the district in which his mine is located, and on referring to this key he finds the number of the zones, as shown on the map, into which the output from his mine may be sent.

A wall map of large size, showing the same zoning in fuller detail, may be obtained from the Coal Zone Map Company, Glen Echo, Md.

Key to Consuming Zones

Zone No. 1 is restricted to coal from North Dakota, South Dakota and that received at docks.

Zone No. 2 is restricted to coal from Illinois (summer only), North Dakota, South Dakota and Iowa (the latter to points in Iowa only), and that received at docks.

Zone No. 3 is restricted to coal from Illinois, western Kentucky and Indiana and that received at docks.

Zone No. 4 is restricted to coal from Illinois and that received at docks.

Zone No. 5 is restricted to coal from Iowa, Kansas, Illinois, Missouri, Oklahoma and Arkansas.

Zone No. 6 is restricted to coal from Illinois and western Kentucky.

Zone No. 6A is restricted to coal from Illinois, western Kentucky and that received at docks.

Zone No. 7 is restricted to coal from Illinois, Iowa (the latter to points in Iowa only).

Zone No. 8 is restricted to coal from Illinois and Indiana.

Zone No. 9 is restricted to coal from Illinois, Indiana and western Kentucky.

Zone No. 10 is restricted to coal from Indiana, Illinois (from the Danville district on the Wabash Ry. only), western Kentucky (goes to Jeffersonville and New Albany only).

Zone No. 11 is restricted to coal from Virginia (on L. & N. R.R.), Tennessee (from M. R. R.), West Virginia (southern), Illinois, Indiana, Kentucky.

Zone No. 12 is restricted to coal from Indiana and Illinois (Danville district on Wabash Ry. only).

Zone No. 13 is restricted to coal from western Kentucky.

Zone No. 14 is restricted to coal from Indiana, eastern Kentucky, West Virginia (northern and southern), Virginia points on L. & N. R. R., Tennessee points on M. R.R., Michigan, Ohio points on G. R. & I. Ry.

Zone No. 15 is restricted to coal from Illinois, Indiana, Kentucky, West Virginia (northern and southern), Virginia points on L. & N. R. R., Tennessee points on M. R.R., and Michigan.

Zone No. 16 is restricted to coal from Indiana, Illinois (Danville district on Wabash Ry. only), eastern Kentucky, southern West Virginia.

Zone No. 17 is restricted to coal from Virginia points on L. & N. R. R., eastern Kentucky, Tennessee points on M. R. R., southern West Virginia.

Zone No. 18 is restricted to coal from Virginia points on L. & N. R. R., southern Kentucky and Tennessee points on M. R.R.

Zone No. 19 is restricted to coal from eastern Kentucky, Tennessee points on M. R. R., western Virginia (southern, also eastern, to points on C. & O. Ry. from Catlettsburg, Ky., to Cincinnati, Ohio).

Zone No. 20 is restricted to coal from Virginia points on L. & N. R. R., eastern Kentucky, Tennessee points on M. R. R., West Virginia (northern and southern), Indiana, Illinois (from Danville district on Wabash Ry. to points in Indiana only), Ohio and Michigan.

Zone No. 21 is restricted to coal from Virginia points on L. & N. R. R., eastern Kentucky, Tennessee points on M. R.R., West Virginia (northern and southern), Ohio and Michigan.

Zone No. 22 is restricted to coal from Virginia points on L. & N. R. R., eastern Kentucky, Tennessee points on M. R. R., southern West Virginia and Ohio.

Zone No. 23 is restricted to coal from northeastern Kentucky, West Virginia (northern and southern, also eastern, along main lines of C. & O. Ry. and N. & W. Ry. to Columbus and Cincinnati, Ohio) and Ohio.

Zone No. 24 is restricted to coal from northeastern Kentucky, West Virginia (southern, also eastern, along main lines of C. & O. Ry. and N. & W. Ry. to Columbus and Cincinnati, Ohio), and Ohio.

Zone No. 25 is restricted to coal from West Virginia (northern, also eastern, along main lines of C. & O. Ry. and N. & W. Ry. to Columbus and Cincinnati, Ohio), and Ohio.

Zone No. 26 is restricted to coal from Ohio.

Zone No. 27 is restricted to coal from Pennsylvania and Ohio.

Zone No. 28 can continue to get coal as formerly except that low-volatile coal in the Pocahontas, Tug River and New River districts on the N. & W. R. R. and the C. & O. Ry. and the Virginia Ry., and Clinch Valley districts in Tazewell and eastern Russell Counties along the N. & W. R. R., also high-volatile east of Charleston, W. Va., on C. & O. Ry. and east of Iaeger, W. Va., on N. & W. R. R. will be restricted to the District of Columbia, (except points on C. & O. Ry), Virginia, (including tidewater terminals) and points in West Virginia on the direct line of the C. & O. Ry. and N. & W. R. R. east and west bound and Virginia Ry. east bound.

Zone No. 29 is restricted to coal from Ohio, West Virginia (northern, also eastern, to points on the direct lines of the C. & O. Ry. and N. & W. Ry.).

Zone No. 30 can continue to get coal as formerly.

Zone No. 31 is restricted to coal from North Dakota, Wyoming, Montana and other fields east of the Rocky Mountains and that received at docks.

Zone No. 32 is restricted to coal from North Dakota, South Dakota, Wyoming and Montana and that received at docks.

Zone No. 33 is restricted to coal from South Dakota, Wyoming, Montana and other fields east of the Rocky Mountains, North Dakota and that received at docks.

Zone No. 34 is restricted to coal from North Dakota, South Dakota, Wyoming, Montana, Illinois (in summer), and that received at docks.

Zone No. 35 is restricted to coal from Iowa, Kansas, Missouri, Arkansas, Oklahoma, Colorado and other fields east of the Rocky Mountains, and from Wyoming.

Zone No. 36 is restricted to coal from Kansas, Missouri, Iowa, Arkansas, Oklahoma and southern Colorado.

Zone No. 37 is restricted to coal from Oklahoma, Missouri, Arkansas, Kansas, Colorado, New Mexico and Texas.

Zone No. 38 is restricted to coal from New Mexico, Colorado and Texas.

Zone No. 39 is restricted to coal from Colorado, New Mexico, Arkansas, Oklahoma and Texas.

Zone No. 40 is restricted to coal from western Kentucky, Alabama and Texas.

Zone No. 41 is restricted to coal from Arkansas, Illinois (in summer), Iowa, Kansas, Missouri and Oklahoma and to that received at docks.

Zone No. 42 is restricted to coal from Arkansas, Iowa, Kansas, Missouri and Oklahoma.

Zone No. 43 is restricted to coal from Iowa, Arkansas, Kansas, Missouri and Oklahoma.

Zone No. 44 is restricted to coal from Arkansas, Illinois, Kansas, Missouri, Oklahoma and Texas.

Zone No. 45 is restricted to coal from Alabama, Arkansas, Illinois (only on lines of St. L. S. W. Ry. and St. L. I. M. & S. Ry.), Kansas, Missouri, Oklahoma, western Kentucky and Texas.

Zone No. 47 is restricted to coal from western Kentucky.

Zone No. 48 is restricted to coal from Alabama.

Zone No. 49 is restricted to coal from Alabama, and western Kentucky.

Zone No. 50 is restricted to coal from southern Kentucky, Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia), western Kentucky, Tennessee and Georgia.

Zone No. 51 is restricted to coal from Alabama, southern Kentucky, Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia), Tennessee and Georgia.

Zone No. 52 is restricted to coal from Alabama.

Zone No. 53 is restricted to coal from Kentucky (southern, also western, to points on N. C. & St. L. and T. C. R.R. Nashville to Old Hickory and Hermitage, Tenn., inclusive), Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia, also Clinch Valley district in eastern Russell and Tazewell Counties), West Virginia (eastern, also southern on C. & O. Ry. east of Charleston and N. & W. Ry. east of Iaeger, W. Va.), Georgia and Tennessee.

Zone No. 54 is restricted to coal from southern Kentucky, Tennessee, Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia), Alabama and Georgia.

Zone No. 55 is restricted to coal from southern Kentucky, Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia), Tennessee, Georgia and eastern West Virginia.

Zone No. 56 is restricted to coal from southern Kentucky, Tennessee, Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia, and Clinch Valley districts in Tazewell and eastern Russell Counties along the N. & W. Ry.) West Virginia (eastern, on C. & O. Ry. and N. & W. Ry. and Virginian Ry.).

Zone No. 57 can continue to get coal as formerly except that coal is to be supplied generally from low-volatile fields.

Definitions

In this key the word "summer" is used to denote time from April 1 to and including Sept. 30, and "winter" from Oct. 1 to March 31.

Divisions of Kentucky are as follows: "Eastern" means all mines in eastern Kentucky on the Southern Railway (Q. & C.), L. & N., C. & O., N. & W. and Long Fork; "northeastern" means sections reached by the Sandy Valley & Elkhorn Ry., Long Fork, C. & O., and N. & W. Railroads in the Thacker, Big Sandy and Elkhorn districts; "northern" means the L. & N. sections in Hazard and Elkhorn districts; "southern" means those reached by the Southern Railway (Q. & C.) and L. & N. in Harlan, Jellico and Southern Appalachian districts; and "western" means those sections reached by L. & N. and I. C. west of Louisville, Ky.

Similarly the three districts of West Virginia are as follows: "Eastern" means those sections reached by the C. & O. and N. & W. in low-volatile fields of Pocahontas, Tug River and New River districts; "northern" those reached by the K. & M., K. & W. V. and C. & C. west of Dundon; and "southern" those reached by the C. & O. and N. & W. in Kanawha, Kenova and Thacker districts.

Key to Producing Districts

Location of Producing Districts	Numbers of Consuming Zones to which restricted
Alabama	40, 45, 46, 48, 49, 51, 52, 54.
Arkansas	5, 35, 36, 37, 39, 41, 42, 43, 44, 45, 46.
California	30.
Colorado	30, 31, 33, 35, 36, 37, 38, 39.
Docks[1]	1, 2, 3, 4, 4A, 6A, 31, 32, 33, 34, 41.
Georgia	50, 51, 53, 54, 55.
Illinois (summer)	2, 34, 41.
Illinois	3, 4, 4A, 5, 6, 6A, 7, 8, 9, 10[2], 11, 12[2], 15, 16[2], 20[2], 14, 45[2], 46[2].
Indiana	3, 8, 9, 10, 11, 12, 14, 15, 16, 20.
Iowa	2[4], 5, 7[4], 35, 36, 41, 42, 43.
Kansas	5, 35, 36, 37, 41, 42, 43, 44, 45.
Kentucky:	
Eastern	11, 14, 15, 16, 17, 19, 20, 21, 22.
Northeastern	23, 24.
Southern	18, 50, 51, 53, 54, 55, 56.
Western	3, 4, 6, 6A, 9, 10, 11, 13, 15, 40, 45, 46, 47, 49, 50, 53[5].
Maryland	57.
Michigan	14, 15, 20, 21.
Missouri	5, 35, 36, 37, 41, 42, 43, 44, 45.
Montana	30, 31, 32, 33, 34, 35.
New Mexico	30, 35, 37, 38, 39.
North Dakota	1, 3, 31, 32, 33, 34.
Ohio	14[6], 20, 21, 22, 23, 24, 25, 26, 27, 28[7], 29.
Oklahoma	5, 35, 36, 37, 39, 41, 42, 43, 44, 45.
Oregon	30.
Pennsylvania	27, 28, 57.
South Dakota	1, 2, 32, 33, 34.
Tennessee (M. R. R.)	11, 14, 15, 17, 18, 19, 20, 21, 22.
Tennessee	50, 51, 53, 54, 55, 56.
Texas	37, 38, 39, 40, 44, 45, 46.
Utah	30, 31, 33, 35, 36.
Virginia (L. & N.)	11, 14, 15, 17, 18, 20, 21, 22.
Virginia[8]	50, 51, 53, 54, 55, 56.
Virginia[9]	53, 56.
West Virginia:	
Eastern	19, 23[10], 24[10], 25[10], 29[10], 53, 55, 56.
Northern	14, 15, 20, 21, 23, 25, 29.
Southern	11, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 53.
Wyoming	30, 31, 32, 33, 34, 35.

[1]South bank Lake Superior and west bank Lake Michigan.
[2]From Danville district on Wabash Ry. only.
[3]Only on lines of St. L. I. M. & S. and St. L. S. W. Rys.
[4]To points in Iowa only.
[5]To points on N. C. & St. L. and T. C. Nashville to Hermitage and Old Hickory, Tenn., inclusive.
[6]On G. R. & I. only.
[7]From mines in Columbiana County, Ohio, only.
[8]All Black Mountain and Stonega districts in Lee, Wise, Dickenson, and western Russell Counties.
[9]Clinch Valley districts in Tazewell and eastern Russell Counties.
[10]Along lines of C. & O. and N. & W. to Cincinnati and Columbus, Ohio.

No Sudden Decline in Price Level*

Data of a Century Show That Fall of Prices Will Be Slow Even When Peace Is Declared—Increased Utility Rates, To Be Just, Must Extend Beyond War Period

BY WILLIAM J. HAGENAH

WE ARE seeing at the present time a most important development growing out of our disturbed economic and political conditions—one which is destined to have a most far-reaching effect on the operations of public utilities. There is hardly an individual or an enterprise that has not already felt this staggering force or is not destined to feel it in the near future, but among all forms of industry which are struggling to effect a readjustment none has suffered so acutely as have the public utilities. I refer to the steadily rising level of prices, to which such decided impetus has been given by our entry into the great European war.

HOW THE UTILITY CRISIS CAME ABOUT

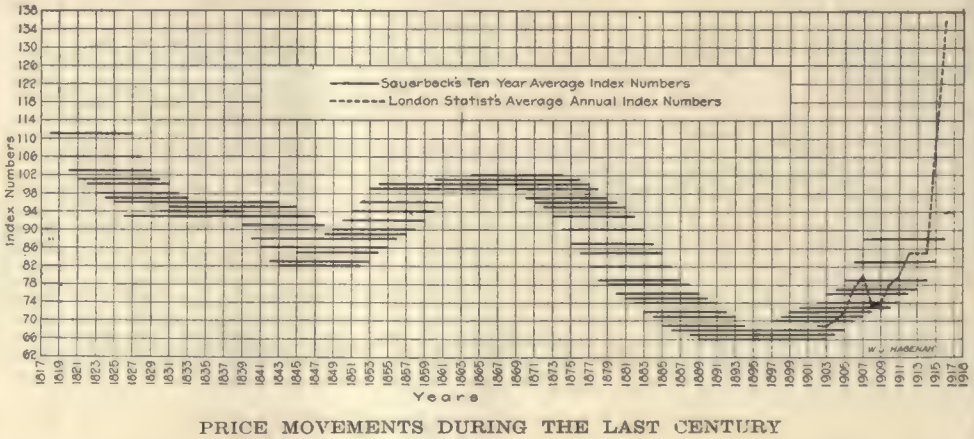
For more than fifteen years before the opening of the European war this country saw a gradually rising price level. Although this tendency has had several brief reversals, subsequent events have shown that these declines were merely fluctuations in the persistent movement to a higher level of wages and commodity prices. Coincident with this movement was our great industrial and commercial development. Private capital grew rich and strong on the unearned increment of a rising market.

The effect of these conditions on the public utilities is now generally known. With the rapid growth of urban population streets were extended in every direction and many new suburbs opened. But while the increased labor and commodity prices, interest rates and taxes caused increases in the operating expenses which were giving concern to the managements, the rates for utility service remained stationary or in many instances were reduced by public action. Moreover, these rates were being paid in a medium of exchange which was suffering a gradually diminishing purchasing power.

So long, however, as the utility had not yet reached the reasonable limit of its technical development and while the territory which it served was still far from being saturated, these increasing costs were largely offset by improvements in apparatus and methods. In fact, there are many instances where net earnings, because of especially favorable local conditions, showed annual increases. When relatively high efficiency had been realized, however, and the increase in the price level appeared to be gaining in momentum, the trend of net earnings in most instances turned definitely downward. With the reasonable limit of expansion reached, the crisis in the history of the utility industry approached. Between the pressure of increasing costs and the declining purchasing power of the dollar of income, net earnings were threatened with extinction.

This, in brief, was the condition of the utility industry when in 1914 the storm of the European war burst on the world—a war which each year has enveloped additional peoples and has gained in fury and destructiveness. With the coming of this war the level of prices, which was already at the highest point reached in a generation, turned abruptly and violently upward. Such a tendency it has maintained to this time. There is to-day scarcely an article of commerce or a form of human service which has not experienced such a great increase in price as to extend beyond every measure of comparison in the experience of men born since the close of the Civil War.

The chart reproduced with this article shows Sauerbeck's ten-year average index prices for the years from 1817 to 1916, on which I have superimposed the annual index prices of the London *Statist* in order to show what has taken place beyond the period covered by the Sauerbeck data and what the extension of the Sauerbeck data for the next few years will reveal. This is the most complete study of price movements with which I am familiar. As it covers the full period during which modern business methods have been developed and extended, it offers the most comprehensive diagram of what has happened under specific conditions and further serves as a guide to what we may look forward to as a result of the recurrence of those conditions.



PRICE MOVEMENTS DURING THE LAST CENTURY

From the high-price level following the Napoleonic wars to the high level of the Civil War period was approximately fifty years. Moreover, after the low point reached in about 1846, it was again fifty years before the low level after the Civil War was reached. Singularly, it is now just fifty years since the high level of

*Abstract of revised transcript of informal talk before Wisconsin Gas & Electrical Association at Milwaukee, Wis., March 27.

prices in the Civil War period. In view of these events of the last century, covering two complete major economic cycles, in each case growing out of conditions similar to those with which the world is confronted at this time, can it be expected that following the declaration of peace in this war prices will quickly decline to the pre-war level or lower?

In spite of prevailing conditions, we appear very prosperous at this time, but let us not be deceived. This is a war prosperity, and both England and Germany report the same kind of business activity. It would be more correct to say that we are extremely busy rather than extremely prosperous, since we are not creating wealth. From this period of intense activity, of strained production and increasing consumption, we shall enter a period after the war when this destruction must be paid for by the hard labor and economies of the people. The reaction will be as great as was the action, but it will be extended over a much longer period of time.

OLD PRICE LEVEL MAY NOT BE REACHED IN FIFTEEN YEARS

This does not mean that we shall at once have a serious depression. On the contrary, the necessity for urgent reconstruction and the accumulation of deferred work, together with the sentimental effect of the return of peace, will lead to considerable activity for a year or more after the close of the war. But the period of readjustment and of producing from the soil and other natural resources and by hard labor the wealth to pay for these struggles will cover many years. During this time we shall undoubtedly experience a relatively high level of prices, but with a gradually declining tendency the world over.

According to the course of the price movement after periods of great world wars in the past and in view of the special conditions with respect to the currency and banking systems at the present time, we may look forward to a considerable period of high prices, a period of business readjustment and a period of new social legislation. What this means in its full significance to individuals, to business in general and especially to public utilities, can be readily understood. The price level under which plants were built, under which franchise obligations were established and on which rate schedules were established, may not again be reached in fifteen years or even longer. It is not difficult to believe that many utility operators will not live to see the return to the price level of 1914.

UTILITIES LOOK TO COMMISSIONS FOR JUSTICE

As a result of the present violent movement the work of the utility commissions has been enormously increased. During the decade of commission activity extending from 1907 to 1917 the almost universal results of commission investigations were reductions in rates. For the larger part of this period the rise in prices was gradual but extremely moderate in comparison with the last two years, but these increases were in many instances offset by the increased efficiency in utility operations and the great extension in service. So elastic was the industry and so quick its response to reasonable rate reductions that these years which represent an almost unbroken record of rate reductions at the same time mark the golden years of utility growth.

At the present time, however, the commissions which were quick to take advantage for the public of every economy in operation or profit resulting from improvements, are now foremost in granting relief from the pressure of high prices. Nearly 500 public utilities have received increases in rates or have been relieved from burdensome obligations by state utility commissions and by city councils within the last fifteen months. If the present tendency to permit increases in rates to offset rising costs continues, the year 1918 will see a practical cancellation of much of the work for rate reduction accomplished by these same authorities after many years of labor. It will also show that the original conception of a public utility commission as a continuing investigating body created to do justice to investor and public alike was correct, and that even in the midst of this great war, wherein every element of our national life is strained to the utmost, the desire for justice and fair play to all interests is still firmly grounded in the heart of the American public.

Growing out of the rapid increase in commodity prices are two important problems which should be developed and properly presented to the regulatory authorities. The justice and necessity of these are apparent from a study of the price movement. They are, first, the necessity of departing from the use of the five-year and ten-year average prices as a basis for rate-making appraisals and, second, the necessity for a larger return on the fair value of the property.

"His Name Is Legion"



A GOOD SUGGESTION FROM THE N. S. C.

IN the special electric railway poster reproduced herewith the National Safety Council calls attention to a class of citizens whose actions are exasperating to the conscientious motorman. If the man depicted in the sketch was injured, he probably filed damage claims.



TRANSPORTATION DEPARTMENT'S OFFICE ACROSS FROM CARHOUSE



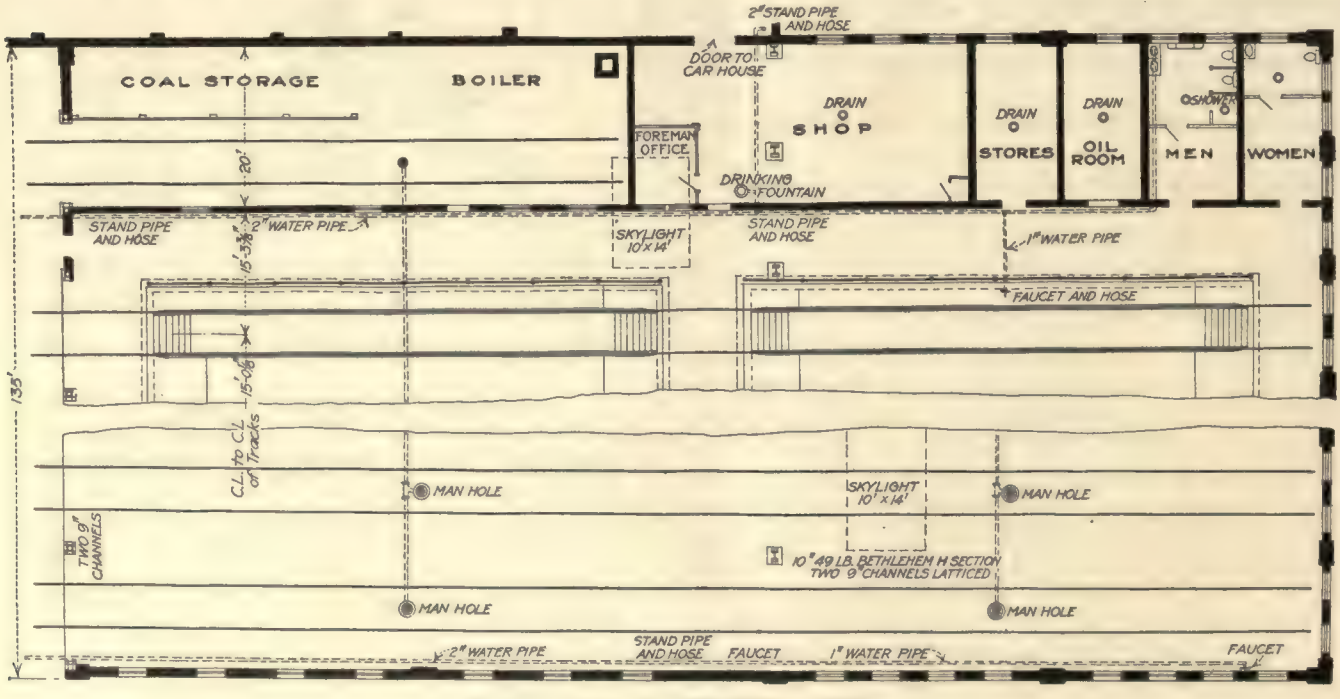
SIDE AND ENTRANCE TO CARHOUSE FROM CLEVELAND AVENUE

Columbus Inspection Shop Rebuilt As Unit, and Track Layout Improved

Inspection Shop and Track Changes at Milo Carhouse of the Columbus Railway, Power & Light Company—Car Movement Facilitated by Substituting Direct Connecting Tracks for Transfer Table

IN LINE with the present tendency among electric railways to arrange their carhouses and yards so that the handling of cars is facilitated and the most favorable and efficient working conditions are secured for making inspections and repairs, the Columbus Railway, Power & Light Company, Columbus, Ohio, has reconstructed and modernized its antiquated inspection shed at Milo. The track layout leading to this shop has also been improved. This property, which originally belonged to the Columbus Central Railroad, is the largest of the five carhouses of the present Columbus system, as nearly one-third of its transportation men work from this point. The buildings at Milo include a carhouse and an inspection shop, located as shown in one of the accompanying illustrations. The inspection shop adjoins the carhouse, about 200 ft. back from the street, and in front of the shop and switching tracks is a substation building which was formerly used for a power house.

The changes in track layout were made to give easier access to the inspection shop. The cars formerly pulled in over a track laid alongside the substation away from



FLOOR PLAN OF INSPECTION SHOP



ENTRANCE TO INSPECTION SHOP OVER NEW TRACK LAYOUT



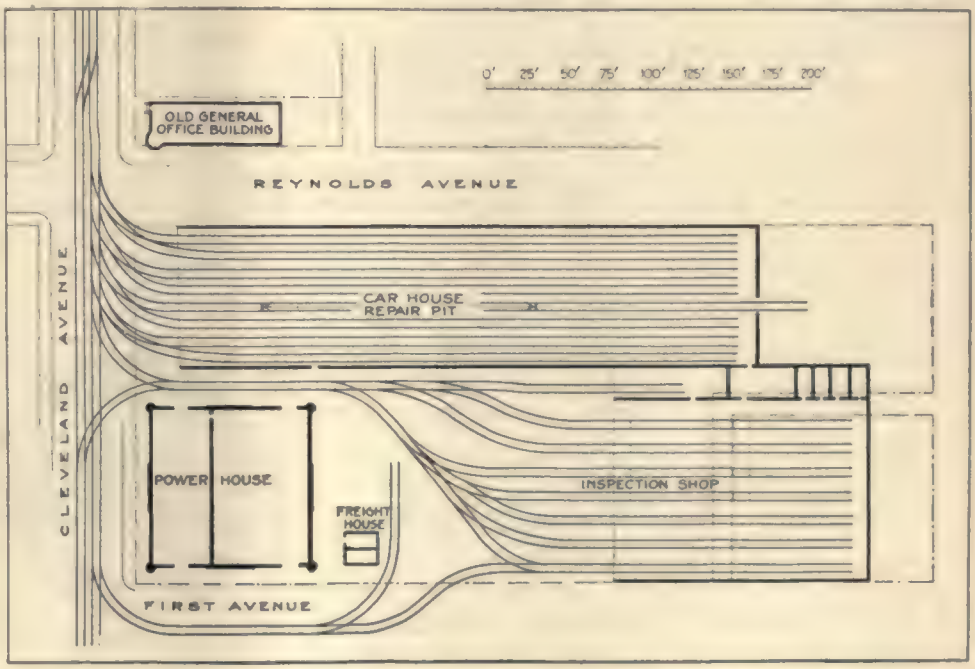
END AND PART OF ENTRANCE TO INSPECTION SHOP

the carhouse, and it had only one switch at the street. With the present layout the cars pull in from either direction over a new track laid between the carhouse and the substation and across the site of a building which adjoined the former and was used for the platform men's room.

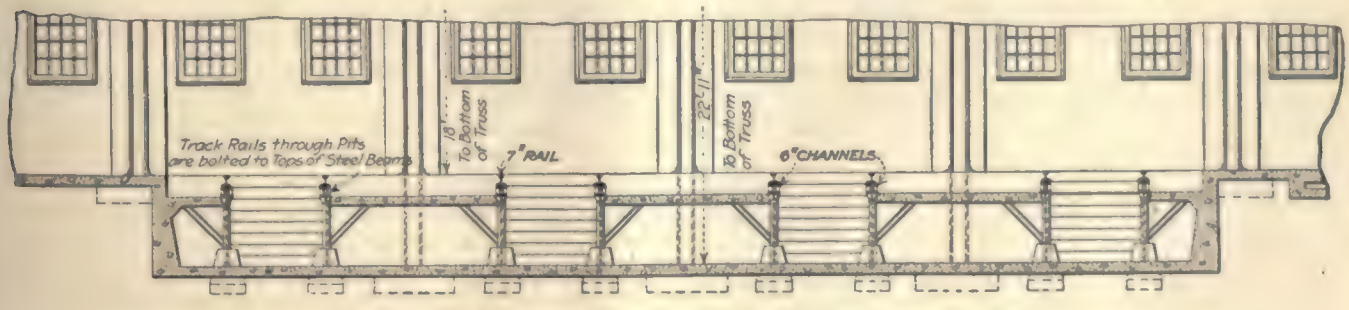
The principal building changes were made in the building now forming the inspection shop, which consists of two brick structures placed side by side. The common wall or partition, at right angles to the direction of the tracks, was replaced with a row of steel columns to support the roof, which was renewed. Sections of the front wall were also removed and steel columns with swinging doors were added to give a direct connection to all of the eight tracks entering the building. Previous to these changes a direct connection was provided for but three of the tracks, and in order to use the others it was necessary to shift the cars by means of a transfer table.

As seen from the accompanying layout, the inspection shop contains seven tracks running the entire length of the building, and several small rooms along one side. The track room is 160 ft. long and 135 ft. wide. Four tracks are constructed over pits for making inspections and repairs, and the remaining three tracks are used when cars are being washed. The entire floor is constructed of concrete, reinforced over the pits. A walk 10 ft. wide and on a level with the rail tops extends across the pits at the middle of the building.

The pit tracks are of open construction, built on short 8-in. I-beam columns, spaced 8 ft. 1½ in. apart. An 8½ ft. space between tracks gives ample room for workmen when repairing cars. Across this space is a 6-in. slab of concrete 13 in. below the top of the rails



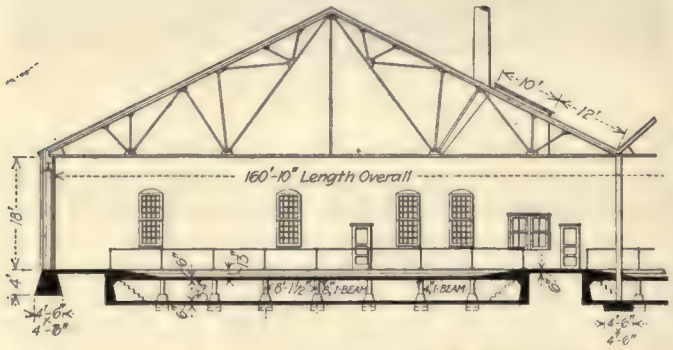
ARRANGEMENT OF BUILDINGS AT MILO AND PRESENT TRACK LAYOUT, COLUMBUS RAILWAY, POWER & LIGHT COMPANY



LONGITUDINAL SECTION THROUGH PITS IN INSPECTION SHOP

and held with 4-in. I-beams supported from the columns. At the ends these walks are ramped up to the tops of the rails. In the car-washing tracks the concrete is sloped to provide surface drainage.

A noteworthy feature of the arrangement of the smaller rooms along the side of the building is the location of a spacious boiler room and coal storage space, with a stub track on which fuel is brought into the building. There is also a hot-water heater in the boiler room for supplying water to the washrooms. One of the small rooms is used as a stockroom, one as a shop and one for oil storage. Special accommodations are provided for women, as it has been the practice of the



SECTIONAL ELEVATION OF INSPECTION SHOP, SHOWING PIT CONSTRUCTION

company for several years to employ them as car cleaners.

The remodelling of the inspection shop permitted the removal of a small shop in the main carhouse. The latter stood near the front of the building over one of the tracks, making it impracticable to use the rear portion of this track except for the storage of sweepers or other inactive equipment. With the maximum use of this track, the building now has a running capacity of about sixty-five cars.

Since the removal of the building containing the men's room to provide space for the pull-in track, as mentioned previously, the transportation foreman's office and quarters for the men are located in a two-story brick building just across the street from the main carhouse.

Pneumatic Tie Tamping Saves on Reconstruction

THE United Railroads of San Francisco recently tried out and adopted a pneumatic tie-tamping outfit which has been found to afford a saving in cost and labor. As careful records were kept of items entering into both hand and pneumatic tamping methods it has been possible to compare the two methods in detail.

The equipment used is an 8-in. by 6-in. Ingersoll-Rand ER-1 compressor which has a piston displacement of 94 cu.ft. per minute. This compressor, sufficient for the operation of four tools, is driven by a 20-hp. motor operated by connection between trolley and rail.

An average of seven jobs in which 2692 ft. of single track was ballasted with hand tamping gave the figures as to this cost given in Table I.

Based on the same wage conditions and on the same track, namely 6-in. by 8-in. ties, 8 ft. long on 2-ft. centers, the costs shown in Table II were found typical for pneumatic tamping. These figures being based on a crew of seven men and four tampers making 180 ft. of single track per day.

TABLE I—COSTS WITH HAND TAMPING

Labor	$0.257 per foot of single track
Tools, superintendence and overhead	0.017 per foot of single track
Total	$0.274 per foot of single track
Or $1,446.70 per mile.	

Thus the saving effected by the pneumatic equipment amounts to about $686.40 per mile of single track. It is believed that a more compact roadbed can be secured by this method. Moreover, the fact that labor required is more than cut in half is considered a strong point in favor of the pneumatic method in times when the labor problem is acute.

TABLE II—COSTS WITH PNEUMATIC TAMPING

Labor, including moving	$0.117 per foot of single track
Current	0.011 per foot of single track
Maintenance, oils, superintendence and overhead	0.010 per foot of single track
Depreciation and interest	0.006 per foot of single track
Total	$0.144 per foot of single track
Or $760.30 per mile.	

The work on the United Railroad properties is under the direction of B. P. Legare, chief engineer of maintenance of way and construction.

New Pressure-Governor for Gas and Liquid Systems

THE details of a new pressure governor for controlling selfstarters used with motor-operated compressors are shown in the accompanying illustration. A graduated pressure scale and indicating needle are used to indicate the pressure and as a guide in making adjustments.

The action of the governor is dependent on the Bourdon tube which is connected to an independent discharge pipe from the pressure tank. The free end of the tube is connected mechanically to the indicator needle referred to above. After the governor has been set to the pressure range desired, it will automatically maintain the pressure within those limits on any gas or liquid system, that will not corrode the Bourdon tube. It can be used on both a.c. and d.c. circuits, and will operate within settings of from 3 to 12 lb.



PRESSURE GOVERNOR WITH CASE REMOVED

The device is made by the General Electric company, in sizes for rated pressures of 60, 100, 160, 300 and 500 lb. Governors for higher pressures can also be supplied if desired. Adjustments of the cutting-in and cutting-out pressures are made by moving the pointers shown at the top of the graduated scale. The case is tapped and drilled at the bottom for the pressure pipe and for making the electrical conduit connections.

Trolley Ear Length Is a Factor in Wire-Wear

Tests Recently Made Show That the Life of the Wire Increases Proportionately With the Length of the Ear

BY G. H. BOLUS
Designing Engineer, Ohio Brass Company, Mansfield, Ohio

MANUFACTURERS of overhead line material list trolley ears in all lengths from 7 in. to 15 in. Sales records show that the railway companies of the United States and Canada are purchasing more 15-in. ears than those of any other length. The average railway man doubtless has standardized on the length of ear which he has found from experience works well on his line, but it is doubtful whether he directly associates the length of the trolley ear with the wear on the trolley wire.

Some railway properties make a practice of starting their installation with a 9-in. ear, operating it until worn out and replacing with a 12-in. ear to cover up the worn spots in the wire. The next renewal would be with a 15-in. ear and later renewals would either be made with this length ear until the wire is worn out, or the ear points would be shifted and the series would be gone through again. This may sound like an answer to the question as to how many trolley ears will be renewed before the wire has worn to such a degree that its renewal is necessary, but it is not intended as such. The writer has found that local conditions so affect results that what would apply on one road would not apply at all on another.

In some cases the wire wears most at the approach side of the ear, (double-track, traffic in one direction) while in others the wear is greatest in the center under the boss. In still others it is at the leaving side. Trolley-base tension, trolley-wire tension, tightness of cross-spans and car speeds all have a bearing on the problem.

The test described gives the results obtained on a line where the wire is worn on the leaving side of the ears.

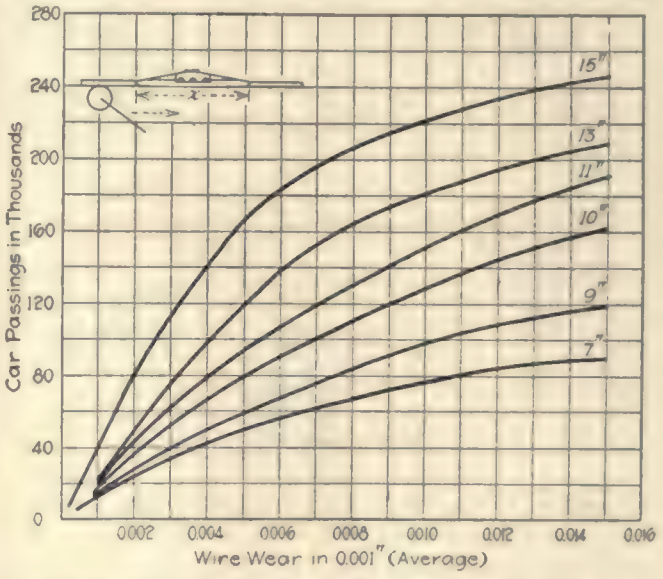
Test samples were made up from extruded metal in 7-in., 9-in., 10-in., 11-in., 13-in. and 15-in. lengths. Extruded metal was selected as uniformity, smooth surface contact and freedom from blowholes and porous spots was essential to insure reliable results. As the extruded metal was produced in lengths of 5 ft. it was easy to alter to the special lengths required for the test ears.

The trolley ears were installed in one of the large, Middle Western cities on No. 00 round Phono-Electric trolley wire which had been in use some time. Six sets of various lengths of ears were alternated on the trolley wire so as to subject them to conditions as nearly uniform as possible. The trolley tension was 1800 lb. with 100-ft. pole spacing. The road was double-track, with 40-ft. poles reinforced at the ground line. Micrometer readings were taken at frequent intervals of the wear on the trolley wire at both the approach and leaving ends of the ears until a wire wear of $\frac{1}{64}$ in. (0.015 in.) on the leaving side of the ear was recorded. When any set of ears showed $\frac{1}{64}$ in. wear they were disqualified and removed, as it was not desired to damage the contact wire unduly in the test. An accurate count was kept of all car passings. The accompanying graphs show the results of the test.

It is interesting to note that the 7-in. ear gave only about one-third of the life, in car passings, of the 15-in. ear for the same wear.

The curves appear to flatten out after the 0.015-in. wear is recorded, but this should not be taken to mean that there would be no wear beyond this point.

The writer has personally inspected trolley ears under a great many operating conditions and it has been his experience that under certain conditions, such as taut trolley wire and slack cross-span wires, short ears of 7-in. or 9-in. length will give satisfactory performance. A number of such installations are in operation in this country, principally in the East. However, where slack trolley tensions are employed, producing considerable sag between supports, there is a hammer blow which causes the trolley wire to be hammered out at the aproach of the ears. Also there is a tendency toward crystallization as the wave impulse set up by the oncoming trolley wheel is abruptly damped out at the short ear, producing a tendency towards hardening of the contact wire and early failure due to crystallization. Under this latter condition a longer ear would undoubtedly give better results.



CURVES OF TROLLEY WIRE WEAR WITH EARS OF DIFFERENT LENGTH

The graphs are not submitted as being conclusive, but they are intended to show the tendency of the short ears to wear the wire on the property where the test was made. It is the intention to make further tests along similar lines in the near future.

Fuel Conservation in Portland, Ore.

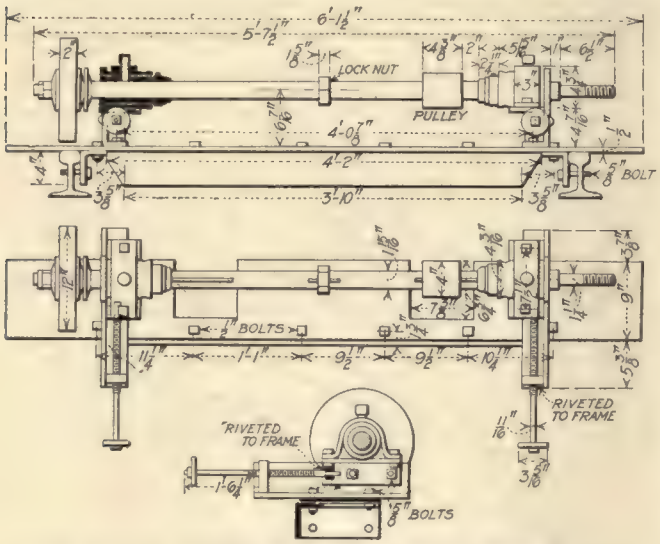
The City Council of Portland, Ore., recently passed ordinances granting permission to the Portland Railway, Light & Power Company and the Northwestern Electric Company to conserve fuel by the construction of large bins near their respective plants for storing refuse from the sawmills of the city. During the summer season when there is a shortage of water this material will probably be used in generating electrical energy.

Efficient Wheel Grinder Made From Scrap Material

BY C. H. COPLEY
Superintendent Springfield (Mo.) Traction Company

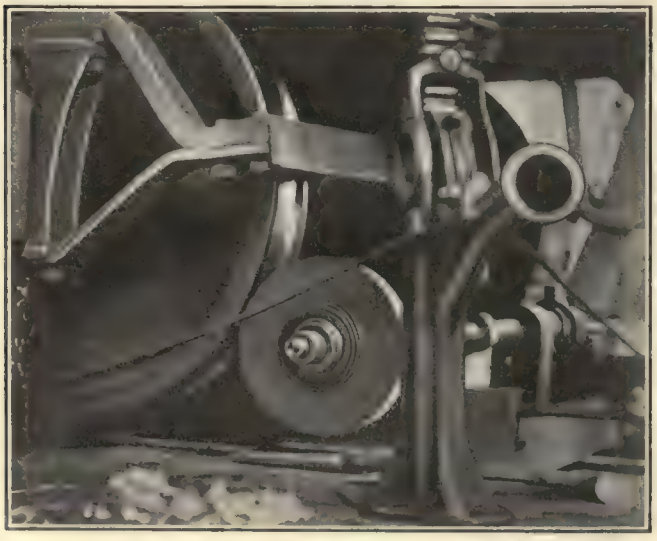
A WHEEL grinder made in the shops of the Springfield Traction Company for our own use has been in operation since the first of the year. During the last three months 130 flat spots have been ground out. The time necessary to grind out a flat spot varies with the size of the flat from twenty minutes to two hours.

Accompanying illustrations show the construction of the grinder and its application to grinding wheels. A



DETAILS OF WHEEL-GRINDER USED AT THE SPRINGFIELD TRACTION COMPANY'S SHOPS

shaft arranged for two 12-in. x 2½-in. emery wheels is supported in bearings just inside the emery wheel. A 4-in. pulley is provided between the bearings for driving the shaft by belt from a 5-hp. direct-current motor



GRINDING A PAIR OF WHEELS OVER THE SHOP PIT

which also drives the rest of the repair shop machinery. The bearings are mounted on guiding rails at each end and the emery wheels are fed into the work by screws working against the bearing plates. The grinder is conveniently mounted on a single base which can be laid across the track under the car and bolted down. By jacking up the pair of wheels to be ground, the operation can be carried out without the necessity of removing the wheels from the truck.

The idea for the construction of this grinder originated from the description of a similar grinder in the ELECTRIC RAILWAY JOURNAL for Feb. 2, 1918, page 240. It was made at a cost of about $75 from old material usually found in the scrap heap.

Gas-Fired Boilers Produce Economies

AT THE annual convention of the Oklahoma Gas, Electric and Street Railway Association held in Oklahoma City on April 22-24, L. A. White, Muskogee Gas & Electric Company, presented a paper on "Gas-Fired Boilers." In this he outlined the situation in part as follows:

In many ways gas is a most attractive fuel for use under boilers. It requires no stoking and no cleaning of fires. A number of boilers may be attended and a constant load maintained independent of manual labor. In Oklahoma gas has been ridiculously cheap as compared with other forms of fuel.

The factors which govern combustion are time, space, and complete mixture of oxygen with the gas. This should be accomplished by putting the gas and air in violent agitation before entering the combustion chamber, but due to the impossibility of reaching each atom of carbon with its share of oxygen when only the proper proportions are present it is necessary to supply an excess quantity of air. Combustion must be completed befor the gases come in contact with the comparatively cool boiler tubes, therefore the necessity of a large combustion chamber.

The tendency of the present day is towards high boiler ratings and large furnaces, and when furnaces are constructed so as to prevent the flame from impinging on the tubes, boilers can be driven at 200 per cent of rating without difficulty. Most of the boilers at Muskogee were originally coal fired, and when gas burners were installed the grates were covered with firebrick, the burners, placed in the furnace door and the flame directed against a checker wall about 30 in. from the end of the burner. This arrangement proved to be satisfactory as long as the boilers were not driven hard, but as the demands on the boilers increased, the grates were removed, and the ash pit lined with firebrick. Finally most of the burners were placed in the ash pit doors thus doubling the size of the combustion chamber and enhancing the capacity of the boilers. The theory of the checker wall was that it would assist combustion by presenting an incandescent surface to the gases, thereby insuring ignition and directing the hot gases at right angles against the heating surface.

It is well known that the orifice of the burner sometimes becomes obstructed, thereby diminishing the flow of gas and necessitating cleaning. If this condition is not general the load will naturally shift to the other boilers and a high gas pressure will be carried to offset the delinquency.

The present-day fuel situation makes it imperative that furnace and boiler efficiencies be given even greater attention than in the past and that our boiler rooms be equipped with the necessary apparatus for procuring the best results.

Foot Control Mechanism Makes One-Man Car Operation Easier

Control and Air Brake Operation by Foot Pedals Leaves Motorman's Hands Free for Cashier Service

TO SIMPLIFY still further the operation of one-man cars, J. S. McWhirter, superintendent of equipment Third Avenue Railway System, New York City, has designed a method of actuating controllers and air brakes by means of foot pedals. The original object of this invention was to enable the operator to control the car movement and still leave his hands free for making change, issuing transfers, operating doors and sanders, and caring for the general safety of the passengers.

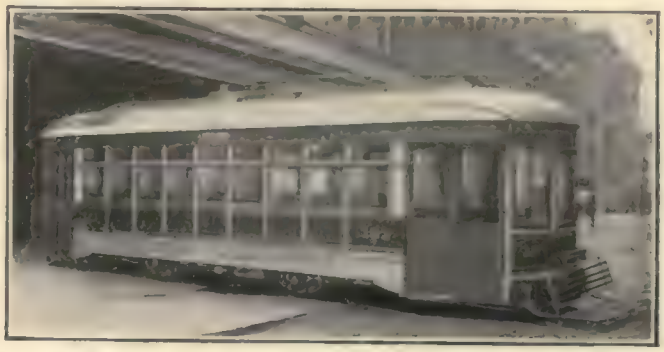
Since the device has been in operation other important advantages have been discovered. The first of these is increased safety, for a man using his hands in the operation of a car in the usual manner does not have the freedom of vision for watching the door and the boarding of passengers that is afforded when operating by the foot mechanism. Another is that when the foot pedal is in use the control and air brakes are automatically interlocked so that the motorman cannot apply power without releasing his brakes. This prevents the waste of energy that is frequently found when motormen apply power to bring a car up to the desired stopping point instead of releasing the brakes when they find that they have misjudged their stopping distance. It prevents also the rounding of curves with both power and brakes applied, for which practice some motormen also have a fondness. It further provides automatically for the proper sequence of operations in the control of the car. That is, power is dropped off before the brakes are applied and the brakes must be released before using power again.

Practical operation of the pedal equipment has shown that it promotes coasting, because the coasting position is a welcome change for the foot, and decreases waste of braking air as the operator is far less likely to "pump" on the pedal than to "fan" the brake handle.

Three cars have already been equipped with the pedal attachment and placed in service on the Chester Hill line of the Third Avenue Railway System. As this is a suburban line with a long headway, it lends itself readily to experiments in one-man car service. The cars equipped are the company's low-level type like the one illustrated. The control equipment on the cars is interlocked with the door operation so that the doors must be closed before the car can be started.

As shown in the cab views, car control is effected by operating the foot pedal which is connected by levers to the handle of the motorman's brake valve as originally installed. This operation also opens and closes the control circuit. Thus when the pedal is pressed down and released power is applied and cut off and the brakes operated in the same manner as is regularly done by the motorman operating the controller and brake valve.

With no foot pressure the pedal is in a raised position and an emergency application of the brakes results. So if the operator lifts his foot the effect of the deadman's handle is obtained. Motormen find it easier to keep the foot pedal depressed than to hold down a handle of the deadman type.



LOW-LEVEL CAR ARRANGED FOR ONE-MAN OPERATION

One of these cars has been in operation, breaking men in for service, since the middle of April. The men take readily to this mode of operation, and apparently find it easier to operate the car with one movement than by two, as is required for operating the control and brakes by hand. With very little practice the men are able to operate the car as smoothly and make stops as accurately as with hand operation and they find it less fatiguing. The present attachments do not interfere with hand operation in the usual manner if emergency should require it.

A swivel seat is arranged for the operator. This is an advantage, for it not only makes car operation by means of the foot pedal easier but it also permits the changing of position necessary to obtain a clear view of passengers boarding and alighting. Time can thus be saved at stops and additional safety to the passengers results.

It will be appreciated that in this pioneer apparatus the inventor has had to work with a controller and brake valve made for the usual hand operation. Eventually the platform controller will be eliminated entirely and the connections to the brake valve made less conspicuous. This will have an additional advantage of requiring less platform space.

Mr. McWhirter has patented his invention and negotiations are now under way with a view to making the devices standard in modern one-man car equipment with other time, labor and life-saving features.



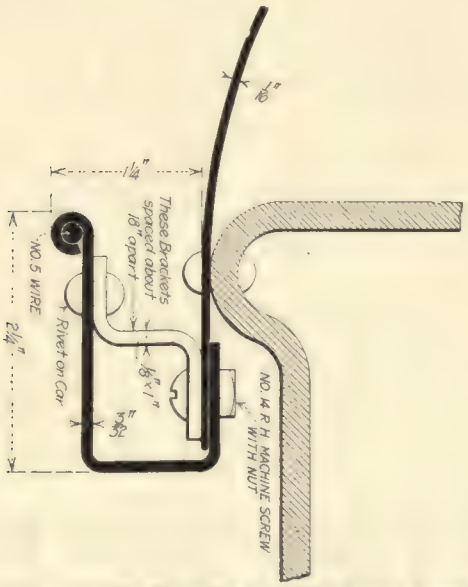
PEDAL ATTACHMENT FOR FOOT OPERATION OF CONTROL AND BRAKES

Gutters on Cars Reduce Labor of Cleaning and Protect Passengers

New Type of Gutter Applied to Cars of the New York, Westchester & Boston Railway

BY R. R. POTTER
Superintendent of Equipment

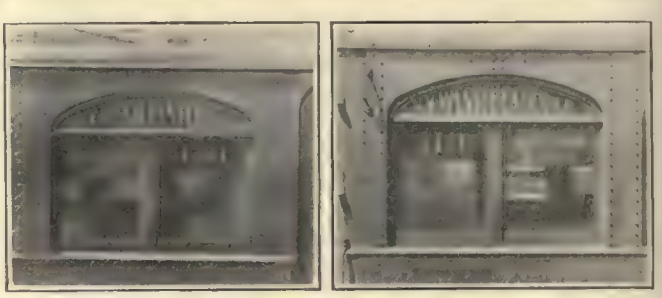
DURING the first years of operation of the cars of the New York, Westchester & Boston Railway a great deal of trouble was experienced with the rust and dirt from the roofs washing down over the windows and sides of the cars. A large part of this was due to the use of steel trolley wire and steel pantograph trolley shoes. Conditions were so bad that it was almost impossible to keep the windows clean and the sides of the cars in a respectable condition. Gutters have been applied to remedy the difficulty, as shown in the accompanying illustrations. These are formed of $\frac{3}{32}$-in. steel bent to proper shape and stiffened with No. 5 steel wire rolled into the rim. Stiffening brackets are installed every 18 inches.



GUTTERS APPLIED TO THE LOWER ROOF SHEETS ON WESTCHESTER CARS



TWO CARS IN SAME TRAIN, ONE WITH AND ONE WITHOUT GUTTERS



CLEAR WINDOWS WHERE GUTTERS ARE APPLIED, AND STREAKED WINDOWS RESULTING FROM ABSENCE OF GUTTERS

During stormy weather the windows and sides of the car are protected from the dirty water from the roof. In addition passengers are afforded better protection when entering and leaving the side doors, as the gutters are much more efficient than the type generally applied over car doors. The illustrations indicate the trimness of appearance which the gutters give to the cars, and also the protection which they afford. The illustrations were made from photographs taken immediately after the cars had been in service during a rainstorm and before any cleaning had been done to the windows or sides of the car. The streaks left by the dirty water on the sides and windows of the cars without gutters are very noticeable. It now seems strange that all railroads do not have their cars equipped with this or similar type gutters.

Reducing Lighting Maintenance Costs

BY W. C. WEFEL
Light Foreman, Denver (Col.) Tramway

THE series burning tungsten lamp has come into general use on electric railways and a substantial saving in power for the same illumination has resulted. It has been found, however, that tungsten lamps require more careful handling and burnt-out lamps are not as easily located as was the case with carbon lamps. This requires more time for their maintenance, which partly offsets the saving in power consumption.

In order to aid in locating burnt-out lamps we have made use of an original shunt or compensating device similar to that used with arc lamps. This has proved a great advantage, especially in one-man car operation. In these short cars but one or two circuits are necessary and by using the shunt device the operator can locate and replace a burnt-out lamp without causing an unnecessarily long delay. The use of this shunting device also permits the use of fewer and larger units for lighting other cars, thus enabling us to take advantage of the greater life given by the larger lamps.

We are contemplating making a change to larger units in some of our cars. These include the replacement of eighteen 23-watt lamps and a 46-watt headlight with nine 56-watt tungsten lamps and a 56-watt concentrated filament headlight. This arrangement requires more power, but we needed the increased illumination.

On some cars it has been the practice to connect the headlight in series with two circuits of lamps. This decreases the liability of having the headlight extinguished by the burning out of another lamp. By using the shunt device previously referred to we have found

that this precaution is not necessary and the headlight can be connected in series with a single circuit.

At our eastern division carhouse we formerly used 230 16-cp. 60-watt carbon lamps grouped in five and ten-light clusters. These have been replaced with twenty-five 100-watt tungsten filament lamps which not only give us more candle power but save 41,245 kw.-hr. per year. There is also a saving in the labor required for the maintenance of these lamps which, taken with the saving in power, makes a total reduction in cost of about $500 per year at this location.

The time now consumed in making lamp repairs on our whole system is about twenty-five man-hours per day. With the changes we have made and contemplate making we expect to reduce this to ten man-hours per day. This reduced maintenance cost, together with the saving effected in power consumption, according to our estimate should produce a saving of more than $7,000 annually on yard and line lighting alone.

Air-Operated Cutting Gun Saves Time and Labor

THE Rivet Cutting Gun Company of Cincinnati, Ohio, has placed an air-operated cutting tool on the market which avoids the slow, expensive work usually done with a sledge and cutting bar. One of its principal features is its small size. It can be operated in very narrow cramped spaces and, by using a long tool, work can be done which would ordinarily require a scaffold to reach. It should prove a very useful tool in the repair shop for cutting off rivets or nuts that cannot be turned due to rust or the end of the bolts that are burred. Chipping can be done much more rapidly and with less danger to the workmen than with hammer and chisel. Where quick work, such as in clearing the track after a wreck or accident, is necessary, such a tool is of great value.

This air-operated cutting gun is most conveniently operated by three men. One guides the tool while the other two steady the extreme end. The gun weighs 65 lb. and can be operated with an air pressure of 60 lb., but from 90 to 110 lb. is desirable for heavy work.

The tool is operated by means of a handle located at the extreme end of the air cylinder. Three positions are provided for the handle: First, a cut-off position which closes the port so that the air connections can be made. Second, a return-stroke position which drives the piston to the rear end of the cylinder. Third, a forward stroke position which sends the piston forward to deliver the blow. For chipping work the valve handle is moved between the forward stroke and the return-stroke position at a convenient speed.



TAKING OFF A NUT THAT HAS BEEN BURRED

LETTER TO THE EDITORS

Safety Code Standards for Forces Acting Upon Transmission Lines

THE CONNECTICUT COMPANY

NEW HAVEN, CONN., May 11, 1918.

To the Editors:

The difficulty of "teaching an old dog new tricks" has been clearly shown in the case of the writer's article in the Feb. 23 issue of the ELECTRIC RAILWAY JOURNAL on "The Forces Which Act Upon a Transmission Line." To him the use of the wind pressure value of 8 lb. per square foot, the old standard, had become such a habit that this value was used repeatedly instead of the Safety Code values in the last paragraph of the first column on page 365, and in the example in the second column on page 366.

In the first instance, since the wind is not an element of the load considered, the fact that the value should have been 12 lb., instead of 8 lb., has little effect, but in the case of the example it is another matter. Using the correct value, the force becomes 213 lb. instead of 142 lb., the bending moments in pound-feet for the upper and lower sets of wires become 24,708 and 11,217 instead of 16,472 and 7478 respectively, and the total bending moment becomes 40,339 lb.-ft. instead of 28,364. The correction results finally in a fiber stress of 2220 lb. per square inch and factors of safety of 2¼ and 1⅛ respectively for chestnut, cypress, Southern pine and Western red cedar, and for Northern white cedars.

Under the caption "How Geography Affects the Sleet Question" appear the values of transverse pressures for the three grades of construction—A, B, C of the Code, namely 12, 7, and 4 lb. per square foot instead of the values for the three districts of loading, which are 12, 8 and 5⅓ lb. per square foot. And in this connection, the use of the word "supports" was not entirely happy, for although the discussion was dealing with wood poles, at one point previously mention was made of other types of support, and for flat surfaces the Code calls for an increase in unit pressure over that for cylindrical surfaces of 60 per cent. This higher value of course would have to be used for square sawed poles.

I am indebted to Kenneth L. Wilkinson of New York City and to Dr. E. B. Rosa of the Bureau of Standards, for bringing these points to my attention. I had hoped to "pin them on the 'printer's devil'" but reference to the manuscript puts them squarely up to the writer. It is with pleasure, therefore, that I find that the apparently overlooked inversion of the equation for fiber stress, near the bottom of the second column on page 366, is up to the compositor; the fiber stress is found by dividing the bending moment by 0.0002638 times the grand circumference cubed.

CHARLES R. HARTE, Construction Engineer.

In order to impress upon employees the opportunity for saving in little things the Toledo Railways & Light Company, Toledo, Ohio, is using some leaflets which are full of human interest. The articles are signed by F. R. Coates, president, and they give practical details of losses and possible savings on the local property.

AMERICAN ASSOCIATION NEWS

War Board Pleased With Special Freight Issue

Headquarters Will Probably Remain At Munsey Building—The Next Meeting Will Be Held on June 7

The Electric Railway War Board held a well-attended meeting at Washington on May 10. Among other topics the board discussed the article by A. B. Cole, prepared with its active co-operation, and printed in the May 11 issue of the ELECTRIC RAILWAY JOURNAL. The board thought highly of the article and is arranging to give it a wide circulation. The board accepted from the Westinghouse Electric & Manufacturing Company, through M. B. Lambert, an offer of one-half of Mr. Cole's time for any investigation which the board desires him to make.

The board discussed the law to allow 3 cents per mile fare for steam roads and considered its relation to electric railway operation; and also the relation of electric railways and the War Finance Corporation. Mr. Gadsden stated that he had written Governor Harding suggesting that in case of any application by public utilities to the corporation the National Committee on Public Utilities be given an opportunity to appear. The work of the national committee was discussed and the statement was made that A. S. Hills will move the headquarters of the Utilities Publication Committee from New York to Washington. Among other matters the desirability of having prepared popular articles of high grade on the public utilities situation was discussed.

Mr. Gadsden reported on conferences with the Shipping Board and the Navy Department with reference to assistance for electric railways from construction plants by way of furnishing platform labor at times of peak load. He also explained that the resolution affecting public utilities recently adopted by the United States Chamber of Commerce was in the hands of its board of directors for further action.

Among other matters considered were these: Mr. Burritt was instructed to send to Washington the results of an investigation on the labor shortage. The use of electric railway lines for government passenger transportation service was taken up. Mr. Gadsden stated that permanent quarters can probably be secured in the Munsey Building, which was recently considered impossible. It was agreed that Bulletin No. 1 of the Return Load Bureau, Highway Transport Commission, Council of National Defense, should be sent to all member companies. Mr. Gadsden stated that he has under discussion with the council the adoption of a resolution with reference to facilitating the use of electric railways in handling freight. Mr. Burritt brought up the subject of the supply of ties for electric railways under the proposed plan of distribution among steam roads and Mr. Gadsden agreed to take up the matter with Hon. John Skelton Williams. It was suggested that in applying the skip-stop plan some railways are not using it in the most satisfactory manner. The board will take steps to furnish information which can be used in so selecting stops, as to produce the best possible results for the public and the railways.

Rhode Island to Receive the Charter Membership Cup

IN ORDER to stimulate the company section movement to the greatest possible extent the ELECTRIC RAILWAY JOURNAL has presented to the association a silver cup to be awarded to the company section organized with the largest membership. The first to receive it will be the Rhode Island Company Section recently organized.

The following extracts from a letter sent by the JOURNAL to President J. J. Stanley explain the plan.



THE COMPANY SECTION CHARTER MEMBERSHIP CUP

In order to encourage the company section movement of the American Association, the ELECTRIC RAILWAY JOURNAL has decided to offer a silver cup to be awarded to the section having the largest number of charter members. The idea is that the cup should be passed from section to section as new sections with larger charter memberships are successively formed. After conference with Mr. Schreiber, chairman of the committee on company sections, and Messrs. Burritt and Clark of the association office, we have selected a solid silver cup, standing slightly over 11 in. high without the base and about 15½ in. high with the base.

It is proposed to letter on one side of the cup approximately the following:

> "Presented by the ELECTRIC RAILWAY JOURNAL to the American Electric Railway Association to be held by the company section with the largest number of charter members."

On the reverse side will appear substantially the following:

> "Held by the Rhode Island Company Section, No. 12, organized on April 6, 1918, with 216 charter members."

In accepting this cup on behalf of the Association President Stanley sent the following letter, dated May 13, 1918:

The American Electric Railway Association, through its secretary, Mr. Burritt, has already accepted the fine offer of the ELECTRIC RAILWAY JOURNAL of a trophy to be awarded to the company section organizing with the largest number of charter members, but I want to thank you personally for this further evidence of the JOURNAL'S interest in the association.

The conception is splendid and I am sure will have the effect of giving the company section movement the impetus it needs and deserves.

The Rhode Island Company Section, No. 12, may indeed be proud to be the first holder of the cup, but I shall be surprised if it retains the honor permanently.

The cup, which was made by the Gorham Company, has the appearance shown in the accompanying half-tone.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Short Strike in Rochester

After They Had Been Out Three Days, Men Return on Basis of Original Settlement Offer

Motormen and conductors employed on the Rochester (N. Y.) lines of the New York State Railways went on strike on May 9 and returned to work three days later. At the time the men went out they were offered an advance in wages of 4 cents an hour, but this offer was rejected. They accepted the offer, however, after they tied up the company's lines for three days. It was also stipulated by James F. Hamilton, vice-president and general manager of the company, that if the Rochester municipal authorities allow the company to increase its rate of fare from 5 cents to 6 cents, an additional wage increase will be granted.

WAGES RANGED FROM 27 TO 31 CENTS

At the time the men went on strike they were receiving a sliding scale of 27, 29 and 31 cents an hour according to the length of time they had been in the company's service. They demanded a wage increase to 40, 42 and 44 cents an hour. The company said it was unable to pay this, and Mr. Hamilton has offered to submit the company's books, records, etc., to the city to show that it cannot operate at a profit and pay the men higher wages with a 5-cent fare. This investigation has already been started by the municipal authorities.

About 1300 men were involved in the strike. The company admitted that the men should have more money, but told them that the company was not in a financial condition to pay a higher wage. Loyal employees advised against a strike at the time, maintaining that the wage question could be taken up with the company after the 6-cent fare question has been solved.

Feeling, however, that the employees should have a higher wage a tentative announcement was made by the New York State Railways that a 4-cent an hour increase would be granted to the platform men as of May 1, making the rate retroactive almost nine days. Even with that announcement, the men agreed to strike and they walked out, leaving the thousands of men employed in the city's war industries without transportation facilities. After a series of conferences between representatives of the men, the federal war department, the municipal authorities and the company, the men agreed to return to work under the 4-cent an hour advance in wages.

In addition to the wage advance, the regular run men are guaranteed ten hours' work each day. Other changes in working conditions are subject to arbitration between the company and the men.

INQUIRY INTO COMPANY'S FINANCES

M. & L. W. Scudder, New York, accountants, have been engaged by the Rochester municipal authorities to investigate the financial conditions of the company. Marvyn Scudder has already arrived in Rochester and has started work on the company's books. While there is some opposition to the 6-cent fare in Rochester, it is generally believed that it will be granted if the report of the accountants is favorable to the company.

The company made no effort to operate cars. There was no disorder.

Mr. Beeler Retained in Dallas

The City Commission of Dallas, Tex., acting on the recommendation of M. N. Baker, supervisor of public utilities, has employed John A. Beeler, New York, to study its street railway transportation problems. Mr. Beeler is expected to arrive in Dallas about June 1. In the meantime Mr. Baker will study electric railway operation in Kansas City, Chicago, Toledo, Detroit, Buffalo, Dayton and Rochester, with a view to making recommendations that will improve conditions in Dallas. The Dallas Railway has also sent Richard Meriwether, general manager, to these cities. He will work with Mr. Baker on the railway traffic investigation. In announcing the employment of a traffic expert, Mr. Baker gave out a statement in part as follows:

"The rapid growth of Dallas during the last ten years has created new and complicated problems of railway operation and traffic management. Some of these problems have been solved by changes already made in the operative methods of our railways, some of them will be solved by the plans that have been made and approved for the new extensions and improvements now under way, but, allowing for the progress thus made, there are still some unsolved problems which demand study.

"It is the aim and purpose of the supervisor's department to assist the railway in finding a proper remedy for these conditions, to the end that Dallas may soon be the equal of any city in the United States with respect to the adequacy and efficiency of its traction system. With this object in view it has been decided to bring to Dallas some competent and recognized authority on traffic questions, to make a close study of the Dallas situation and prescribe the proper measures for its relief."

Fares and Wages Coupled

P.R.T. Points Out Wherein Raise in First Is Necessary Before Second Becomes a Fact

The management has acknowledged the petition of the employees of the Philadelphia Rapid Transit Company asking for an increased wage and requesting the company to petition Councils for an increase in fare in order to make this wage increase possible.

Of the 9714 employees of the company on duty 9388 have signed their names in approval of the petition, while only 326 have not signed. Thus 96.6 per cent of all the employees are working in accord with the plan.

The fact that these signatures were obtained in the face of the protests of professional trouble-makers who are seeking to serve their own ends is pointed to in a statement to the men as proof that those who have been working under the co-operative plan for the past seven years are, as they state in the petition, satisfied with working conditions and wish the present plan of representation continued.

This expression of loyalty and satisfaction from the men has been laid before the gentlemen representing the federal and State authorities to prove that there are no questions between the company and its employees requiring their services. The scope and working of the co-operative plan have been explained in detail to the public authorities, particularly the fact that the trainmen are represented at all times by a committee of their own choosing who could take up with the management all matters requiring discussion or adjustment.

The federal and State authorities have been advised that the company will deal only with the duly-elected committeemen, and that the co-operative plan will continue effective as at present administered until two-thirds of the men ask that a change be made.

The company has expressed to the men its appreciation of their willingness to co-operate in securing the increased fare necessary to make the advance of 5 cents per hour to meet the increased cost of living.

Without any increase in fare the company has already increased its wage scale so that at present it amounts to $1,750,000 a year more than it did at the time the country entered the war. Belief is expressed by the company to the men that the appeal by them to their representatives in Councils will be recognized as fair and reasonable, and that the company will be able to secure the advance in fare necessary to make possible the increased wage.

Tentative Chicago Franchise Settlement Terms

Council Committee Approves Them—Brief Review of the Proposed Provisions of Grant

Tentative approval of terms for a new franchise for the surface and elevated railways of Chicago was given by the City Council committee on May 11. The terms which were under discussion were outlined in the issue of the ELECTRIC RAILWAY JOURNAL for May 4. The provisions favored by the Aldermen were a compromise of three plans submitted previously. They are to be drafted in ordinance form for final consideration.

As they now stand, the provisions for rate of return and life of franchise do not agree with the companies' views. Neither does the proposed grant meet with the approval of the committee's special attorney, who had recommended a plan of municipal ownership and operation through a "trustee corporation." This apparently was not received seriously by the Aldermen, and there were some objections by representatives of organized labor.

The committee had previously approved an outline of physical construction for the companies under the proposed grant. This would call for the expenditure of about $100,000,000 in six years. This program has not been changed. The tentative provisions for life of franchise, rate of return and method of control are as follows:

The proposed unified corporation is to receive a franchise for thirty years, subject to city purchase at any time or taking over by the city at the end of this period subject to outstanding indebtedness. The city may also designate a licensee to take over the property after thirty years subject to outstanding liens. If neither the city nor another licensee takes over the property after thirty years the company may continue to operate without profit other than interest on the investment.

The company is to be allowed a maximum return of 6 per cent on the initial purchase price and, if earned, an additional amount ranging from two-tenths to five-tenths of 1 per cent on the capital account. In refunding outstanding bonds the company is to be allowed the cost of such refunding up to a limit of 5 per cent, this to be governed by the board of regulation and control. The company is to be allowed a return on new money only at cost, and the city's traction fund is to receive the same rate of return as this new money.

A body similar to the state public utility commission and having similar power over Chicago traction lines is to be created and called the board of regulation and control. Members are to be appointed by the City Council.

The rate of fare is to be 5 cents, with a transfer charge between surface and rapid transit lines not exceeding 2 cents. Increases and decreases in fare and transfer charges are to be authorized when necessary, but before putting into effect any increase the company may be relieved of non-transportation charges such as cleaning and sprinkling right-of-way and contributing to the cost of paving streets where it operates.

Preparation of the ordinance will be hastened with a view to getting action by the City Council before adjournment. If the ordinance is passed it will be submitted to the voters next November, and if approved by them it will go to the State Legislature for legislation which is necesary before it can become effective.

Six-Cent Wage Advance

With it Goes an Increase in Fare Backed by an Injunction Preventing Interference by City

The employees of the Toledo Railways & Light Company, Toledo, Ohio, on May 10 agreed to accept an increase of 6 cents an hour in wages. An injunction will prevent the city from interfering with the increase in the rate of fare to meet the increased wages.

The restraining order granted by Federal Judge John M. Killits to prevent the city from interfering with the company in raising its rate of fare to meet the expense of increasing wages went into effect on May 10. It was to hold until May 15, and May 14 was set as the date for hearing the case. Immediately upon being served with notice of the order Cornell Schreiber, Mayor, issued a statement in which he asked the people to abide by the court's decision.

H. L. Doherty & Company, New York, filed the case in the Federal District Court, but Frank Coates, president of the Toledo Railways & Light Company, entered a separate motion, asking for a temporary restraining order. R. H. Brunning, expert accountant, who examined the books of the company for A. L. Faulkner, representative of the United States Department of Labor, made an affidavit to the affect that it would be impossible for the company to increase the wages of the men without suffering a loss unless the rate of fare was increased. He gave the court the result of the audit he had made to support his assertions.

In granting the order the court said that it was necessary to secure the operation of the cars and to keep the complaining company from loss and the public from irreparable injury.

The rate of fare will be 5 cents straight, with a 1-cent charge for each transfer. Children under eight years of age are to ride for 1 cent. The restraining order would have allowed the company to make the fare 6 cents, if it had so desired.

According to Henry L. Doherty, chairman of the board of the company, an increase of 6 cents an hour in the wages of the men would mean an additional expense of $400,000 a year to the company, while the increase in the rate of fare made, together with the car fund which has been paid to the Federal District Court, would amount to only about $200,000 annually.

Milwaukee Trainmen's Wages Adjusted

Announcement Is Made of Ratification of Agreement for Advance of Ten Cents an Hour

It was announced on May 4 that the trainmen in the employ of The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., had ratified the agreement entered into on April 30 between the company and the labor adjustment committee of the Employees' Mutual Benefit Association. As a result of this agreement the wages of the men have been increased 10 cents an hour from May 1.

PROBLEMS DISCUSSED AMICABLY

The questions of wages, hours and working conditions had been under discussion some time prior to May 1. The labor adjustment committee of the Employees' Association was acting under the general labor contract executed between the company and the association on April 10, 1918. Under this contract the company agreed to recognize the right of the members of the association to deal collectively with the company in the matter of wages, hours and working conditions. Both parties agreed to submit to arbitration any differences which could not be settled by negotiation. The company agreed to maintain wages in accordance with the relative cost of living referred back to 1914 as soon as it was provided with the revenues necessary therefor. The labor adjustment committee conferred with the Railroad Commission of Wisconsin and ascertained that it was the commission's intention so to adjust fares as to permit fair wages to be paid and this lead up to the settlement of the subject announced on April 30.

One by one differences between the committee and the company were removed, but with the approach of May 1 and the prospect not certain that all subjects in disagreement could be adjusted by that time, it was decided to continue with the meetings and go to arbitration with such matters as had not been settled by negotiation by May 3. The understanding on this point, reached on April 29, was as follows:

POINTS OF AGREEMENT

1. Consideration of plans for an eight-hour work day shall be postponed until it becomes more generally adopted in the electric railway industry, and the government's requirements for labor are less urgent.

2. The schedules shall be so arranged that the maximum possible number of runs shall be completed in twelve hours spread-of-duty. The committee may investigate the schedules and suggest changes.

3. The wage increase shall be effective from May 1.

4. All of the wage increase to become effective May 1 shall be paid as an increase in the hourly wage scale.

5. Negotiations shall be continued and an agreement arrived at if possible

by May 1; if an agreement is not reached by May 3, the matter shall be arbitrated under the provisions of section 10 of the contract of April 10, 1918.

It was in accordance with the spirit of this preliminary understanding that the wage adjustment was effected on April 30 without the need of going to arbitration. The agreement was thereafter ratified by the members of the association.

Eight-Hour Day on Coast

The Puget Sound Traction, Light & Power Company, Seattle, Wash., has established the basic eight-hour day for the 1800 railway employees in Seattle. The order, however, requires the trainmen to work ten hours daily, overtime being paid after eight and one-half hours. The new schedule went into effect on April 27.

A. W. Leonard, president of the company, states that the purpose in adopting the principle of the eight-hour day was the betterment of service. A labor shortage existed, and the company believed that the recognition of the eight-hour day would make employment with the company more attractive. Mr. Leonard asserts that the company could ill afford to pay time and a half for overtime, but it was forced by the present emergency in the transportation situation in Seattle to make this concession.

J. S. Wallace, secretary of the union of employees, stated that while the adoption of the eight-hour principle was one of the concessions for which the men were working, the methods by which the company proposed to apply it was not satisfactory, and would not be accepted as a settlement with the company of the present disagreements.

The Tacoma Railway & Power Company, Tacoma, Wash., has also established the eight-hour day, following the order in Seattle.

Men Object to Women on Cars

It was announced during the week ended May 11 by R. J. Fleming, general manager of the Toronto (Ont.) Railway, that on account of the scarcity of men the company intended to employ women. A meeting of the employees of the company was held on the evening of May 11 to discuss this proposal, at which meeting the men passed a resolution which was concluded as follows:

"Therefore, be it resolved that, if the company insist on employing women, we will refuse to instruct or operate a car on which women are placed for the reasons set forth. And any attempt on the part of the company to discipline or discharge motormen or conductors for so doing will be met with by prompt action by members."

The company's announcement said that women would be employed and that it was intended to use pay-as-you-enter cars. It was pointed out that special provision was being made to take care of women employees, who would have special quarters and a matron in charge, and that the women would be treated the same as the men with respect to pay and hours. The women are to be required to train for two weeks, after which they will receive 30 cents an hour for the first six months, 32 for the next six months and after that 35 cents up to two years' service. They will then receive 37 cents an hour. It was stated that the project had been under discussion for some time and that the board of directors had given its sanction.

The matter is before the Ontario Railway & Municipal Board. If the board gives its approval the company will commence the reconstruction of cars to the pay-as-you-enter type. A model of the proposed type is already in the city for experimental purposes. The folding doors will be worked by air and the signal to start will be automatically given to the motorman by the showing of a light as soon as the doors are closed.

Protests against employing women workers have been received from the men employees by the company, but Mr. Fleming stated that the company would sooner employ patriotic women than the number of foreigners it now employs.

Naval Training for Technical Men

Two courses for service in the navy in steam engineering, electrical engineering and radio duties have just been announced. The first is offered by the Bureau of Navigation, Navy Department, for applicants with the following qualifications: (1) An engineering degree from a college of recognized standing; (2) Two and one-half years' practical experience subsequent to graduation; (3) Not more than thirty-five years of age; (4) Good physical condition. Tuition will be given at Annapolis for four months, after which those who finish the course successfully will receive further training ashore or afloat.

The second course is offered by the Navy Department in steam engineering only and has been established with headquarters at the Stevens Institute of Technology, Hoboken, under the guidance of Dean F. L. Pryor as civilian director. It will consist of five months' training, part of which will be given at Pelham and part on board ship and will lead to the commission of ensign. The school is open to men between twenty-one and thirty years of age who are physically qualified, of thorough ability and officer-like character and have completed the engineering course at any recognized technical school. Information in regard to this course can be obtained from Stevens Institute or of both courses from the Engineering Council, 29 West Thirty-ninth Street, New York.

The Aurora, Elgin & Chicago Railroad, Wheaton, Ill., has restored parlor and buffet car service between Aurora and Chicago.

News Notes

Wage Increase in Binghamton.—The Binghamton (N. Y.) Railway has announced an increase of 2 cents an hour in wages.

Wage Raise in Rockford.—The Rockford & Interurban Railway, Rockford, Ill., has extended to all employees a flat increase of 3 cents an hour, effective May 1.

Wage Increase in Wilkes-Barre.—The trainmen in the employ of the Wilkes-Barre (Pa.) Railway have received increases in wages to 28, 30 and 32 cents an hour, adding $56,000 to the annual payroll.

Ask Receiver for Wage Raise.—Platform men employed by the Buffalo (N. Y.) Southern Railway have made application to the receiver for an increase in wages of 2 cents an hour. The men now receive 28 cents.

City System for Peking.—Petitions for a street railway system in Peking signed by a number of Shanghai merchants are now before the Chinese government for sanction. Tientsin and Shanghai have city railway systems.

Wage Increase in Topeka—The Topeka (Kan.) Railway has granted an increase of 5 cents an hour to each trainman and 3 cents to each job and carhouse man. The former scale for trainmen was 21 to 26 cents an hour. In addition a bonus of 10 per cent is provided.

Peoria Men Want Increase.—Employees of the Peoria (Ill.) Railway have asked the company for 40 cents an hour the first year and 45 cents an hour thereafter. The present scale is 20 cents an hour the first year, 29 cents the second year and 33 cents thereafter.

Wage Bonus During War.—The Texas Electric Railway, Dallas, Tex., announced a salary increase of 3 cents an hour for all employees, effective on May 1. The advance will be paid as a war bonus, but will in no way interfere with the regular salary increases which recently became effective.

Wage Increase in Dallas.—The Dallas (Tex.) Railway announced a wage increase of 3 cents an hour effective on May 1. According to the announcement it will remain in effect during the war. The men of the line department will get an increase of 2 cents an hour and the trackmen an increase of 2½ cents an hour. The trackmen's raise went into effect thirty days ago.

Looking Toward Municipal Ownership.—At a meeting of representatives of the five border municipalities held in Windsor, Ont., on May 8, a resolution was adopted requesting the Ontario Hydro-Electric Commission to make a

survey of the local electric railway system with a view to control of the lines being assumed by the municipalities in 1922, when the present franchises expire.

Labor Administrator Appointed.—President Wilson, on May 11, placed in the hands of Felix Frankfurter, New York and Washington, the task of whipping into definite form a national labor policy for the war. Mr. Frankfurter's appointment makes him "labor administrator" under Secretary of Labor Wilson. He will immediately co-ordinate under his direction the work of all the numerous labor adjustment bodies now existing in the government.

Dubuque Wage Board's Findings.—The Union Electric Company, Dubuque, Ia., has granted a flat wage increase of 5 cents an hour to all trainmen except those who have been employed more than four years. The latter receives a flat increase of 6 cents an hour. The increase is in accordance with the wage award of a board acting for both the men and the company. The demands of the men were for slightly higher rates than those granted by the board.

Increase for Cairo Men.—The Cairo Electric & Traction Company, Cairo, Ill., included in the Illinois Traction System, has increased the wages of first-year trainmen on city cars to 27½ cents an hour and for men serving beyond their first year to 30 cents an hour. Wages for first-year men on interurban lines have been increased to 26 cents an hour and for men beyond their first year to 32 cents an hour. This is an increase of 7½ cents for all men concerned.

War-Time Conference With Governor.—Representatives of the public utilities operating in Tennessee conferred recently at Nashville with Governor T. C. Rye in regard to the problems that confront the electric railways, electric light companies and the gas interests. It was brought out that the present extraordinary service demands, war conditions and other needs make imperative higher rates and larger resources if the companies are to work at maximum efficiency.

Exit the Squealing Brakeshoe.—The Interborough Rapid Transit Company, New York, N. Y., has been ordered to substitute a lubricating brakeshoe on all cars not equipped with this type. The motor cars of the "L" trains have the flanged shoes now, but a non-flanged shoe with no lubricant device, is used on most of the trail cars. No order was issued with respect to Brooklyn trains owing to the fact that within the next two years the Brooklyn Rapid Transit Company is planning to put new steel cars in operation, equipped with non-squealing brakeshoe.

Buffalo Agitators Active.—Two days before the petition of the International Railway, Buffalo, N. Y., seeking an increase in fare was filed with the City Council several hundred employees of the company made an effort to bring about a strike but without success. International officers of the carmen's union came to Buffalo and the majority of the men agreed to remain loyal to the company pending the outcome of the application for increased fares. The company has offered to increase the wages of the men 6 cents an hour if the 6-cent fare is granted.

Additional Municipal Bus Service.—An extension of municipal auto bus service in San Francisco has been ordered by city officials to serve new territory in the western addition. Fred Boeken, superintendent of the Municipal Railway, will direct the installation of the new service. The first municipal buses which were put in operation on Jan. 15 to serve as feeders to the Geary Street line were described in the ELECTRIC RAILWAY JOURNAL for Feb. 16, page 327. They cover two routes across Golden Gate Park, rendering service in what is known as the Sunset District.

Texas Companies Increase Wages.—A salary increase of 3 cents an hour was granted on May 1, to all employees of the Houston (Tex.) Electric Company, Galveston Electric Company, Galveston-Houston Interurban Railway, Beaumont Electric Company, the Port Arthur Electric Company and the Beaumont-Port Arthur Interurban. The announcement was made from the office of L. C. Bradley, Houston, district representative in Texas of Stone & Webster. The increase makes the maximum salary for city railway employees 35 cents an hour and for interurban trainmen 39 cents an hour.

Arbitration in Wheeling.—Officials of the Wheeling (W. Va.) Traction Company, West Virginia Traction Company, of the Pan Handle Traction Company and of the Steubenville Traction Company and employees of those companies have been in conference in an effort to reach an agreement on wages and other terms of service. The employees, who are receiving from 30 to 33 cents an hour demand an increase to 55 cents an hour as a maximum. Inasmuch as it has been impossible to reach an agreement it has been decided to submit the differences to arbitration. Both sides have selected arbitrators who have agreed upon a third arbitrator to be assigned by the Department of Labor.

Fuel Engineer for Pittsburgh District.—On May 8 the United States Fuel Administration announced the appointment of Thomas R. Brown, Pittsburgh, Pa., as administrative engineer for the Pittsburgh district. This appointment was made as a preliminary step toward putting into operation a general plan for fuel conservation in power plants. The program at present in effect in Pittsburgh, which will be used as a model, comprises personal inspection of every power plant, its classification and rating, based on the thoroughness with which the owner conforms to the recommendations of the Fuel Administration, and an administrative engineer in charge of the work in each state or district. It is expected that from 10 to 20 per cent of the coal used annually in industrial plants will be saved by this plan.

Programs of Meetings

Missouri Association of Public Utilities

The annual meeting of the Missouri Association of Public Utilities is scheduled to be held at St. Joseph, Mo., on May 17 and 18. The program of papers is as follows:

"Work of National Utilities Association," by Philip J. Kealy, president of the Kansas City (Mo.) Railways.

"How War Conditions Have Affected the Utilities of the State and the Nation," by H. Wurdack, president and general manager of the Light & Development Company, St. Louis, Mo.

"Problem of Manufacturing Under War Conditions," by J. S. Tritle.

"Taxes Affecting Public Utilities," by H. Spoehrer, secretary and treasurer of the Union Electric Light & Power Company, St. Louis, Mo.

New England Street Railway Club

The New England Street Railway Club will hold its monthly meeting on May 23 at the Hotel Brunswick, Boston, Mass. It will be the last get-together for the season. The speakers will be Lieut. Godfrey L. Cabot, N.R.F.C., president of the Aero Club of New England, and Lieut. Parker H. Kemble, N.R.F.C. The subject will be military aviation. Lieutenant Cabot is one of the most active promoters of the development of aerial navigation and engineering. He is vice-president of the Aero Club of America, and a member of the contest committee and marine flying committee of that organization. Lieutenant Kemble is an officer in the Naval Reserve Flying Corps. He will give a stereopticon talk, presenting a most interesting collection of airplane views, showing their development, the different kinds and how they look in action.

Arkansas Association of Public Utility Operators

The Arkansas Association of Public Utility Operators will meet in the eleventh annual convention at the Arlington Hotel, Hot Springs, Ark., on May 21, 22 and 23. The program of papers includes the following:

"Transmission Line Construction," by William Crooks, manager of the Arkansas Light & Power Company.

"Present-Day Fuel Situation," by J. F. Christy, manager of the Jonesboro Water & Light Company.

"War-Time Costs vs. Rates," by A. Patterson, superintendent of the electric department of the Southwestern Gas & Electric Company.

"Courteous Attention to Traveling Salesmen," by W. R. Herstein of the Electric Supply Company, Memphis, Tenn.

George R. Belden, S. E. Dillon, U. N. Gladson, dean of the College of Engineering of the Arkansas State University; Rev. Dr. W. N. Waldrip and Charles A. Brough, Governor of Kansas, will address the delegates.

There will be a patriotic dinner at the Arlington Hotel on the evening of May 22.

Financial and Corporate

Valuation Hearing Closed

Washington and Idaho Commissions Close Case to Determine Spokane Values for Rate-Making

The direct testimony before the Washington and Idaho Public Service Commissions in the valuation case of the Washington Water Power Company, Spokane, Wash., was concluded at the hearing on April 25. Henry L. Gray of Seattle, consulting engineer, was called as the first witness for the company. According to the figures of Mr. Gray, the total valuation of the Washington Water Power Company, with due allowance made for necessary overhead charges, was $29,938,660, of which the generating system, valued at $15,754,216, was the largest item. He valued the combined city and interurban railway at $5,068,512.

Engineer McCurrach, for the Washington Commission, on April 25 presented a supplemental report, bringing the appraisal of the Washington Water Power Company to December, 1916, as compared with June 30, 1915, the date covered in his first report. This subsequent appraisal is based on additions actually made to the property since June 30, 1915, as shown by the books of the company. Prices are based on the five-year average from 1910 to 1915. Following are the figures:

WASHINGTON PROPERTY

	June 30, 1915	Dec., 1916
Railway system	$5,502,422	$5,593,214
Light and power system	13,505,694	13,814,977
Non-operating property	893,855	893,785
Totals	$19,901,971	$20,301,976
Lands—railway	$447,004	$438,453
Lands—light and power	1,114,904	1,114,232
Totals	$1,561,908	$1,552,685
IDAHO PROPERTY		
Light and power system	$2,326,669	$2,478,890
Non-operating property	42,586	42,586
Totals	$2,369,255	$2,521,476
Lands—light and power	123,560	143,203
Grand totals, Washington and Idaho	$23,956,694	$24,519,340

Another table of appraisal values was presented by Engineer McCurrach, prepared at the request of Attorney F. T. Post for the company, based on prices prevailing from 1912 to 1916, a period in which materials and labor cost more. These figures showed:

Washington totals	$23,490,484
Idaho totals	2,839,626
Grand total	$26,330,110
Increase over regular appraisal figures	$1,820,770

The appraisal of Engineer McCurrach on the railway property of the company to December, 1916, on the 1910-1915 basis shows:

RAILWAY PROPERTIES VALUES

Spokane street railway	$4,732,521
Interurban system	860,693
Lands—Spokane railway	259,761
Lands—Interurban	178,692
Total	$6,031,667

A calculation of what he thought was a fair system of annual depreciation allowances to be made on the property of the Washington Water Power Company was presented by Mr. McCurrach, showing:

	Per Cent	Amount
Spokane street railway	3.99	$191,185
Interurban railway	3.85	32,613
Light and power, Washington	3.51	480,862
Light and power, Idaho	3.49	86,067
Total annual depreciation	3.62	$790,727

The case was concluded on April 26. Fifteen days were allowed in which to file briefs. It is expected that a decision will be rendered by June 1. This case was referred to previously in the ELECTRIC RAILWAY JOURNAL for March 23, page 584.

$22,676,277 in Bond Issues Sanctioned

The Capital Issues Committee announced on May 13 that the number of applications considered during the week ended May 11 was greater than in any previous week of its existence. The committee determined thirty-seven cases, aggregating $27,487,277, of which $4,811,000 was disapproved. In addition to the amount formally disapproved, postponement for the period of the war was secured informally of issues aggregating $4,990,000. The $22,676,277 approved included $6,777,084 of refunding obligations, so that the new issues approved aggregated $15,899,193. New issues for the corresponding period last year amounted to $14,196,500.

The committee stated that spread of the knowledge of its aims and purposes continued to be reflected in voluntary postponement of security issues, that case being cited in the city of St. Louis, Mo., which has adopted a policy of financial preparedness consistent with the national welfare. The city has notified the committee that it is going ahead with securing local authority to create certain debts and advertising the issues of bonds therefor so that they may be marketed readily at the proper time, but that it will submit for approval by the committee only such issues as are for urgent and essential purposes. The city is at present advertising some $14,000,000 of bonds which it does not propose to market until the conclusion of the war. Other municipalities in Federal Reserve District No. 8 are adopting the same patriotic course. The Milwaukee member of the sub-committee of the Minneapolis Federal Reserve District reports that the city of Milwaukee, in bringing its needs into conformity with the national interests, has reduced presently contemplated bond issues from $5,740,000 to $1,050,000.

It is pointed out that the pursuit of this policy of capital conservation throughout the country will give to the nation that financial strength which will enable it to shorten to a material degree the period within which the war can be ended with victory for democracy.

1917 Increase Ten Per Cent

Banking House Summarizes Reports of Gross Earnings for 100 Utilities—Net Falls Off 2.8 Per Cent

In a tabulation of earnings of 100 public utilities Harris, Forbes & Company, New York, N. Y., submit statistics which, because of the abnormal conditions prevailing in the public utility industry during 1917, should be of unusual interest to investors. The reports from these companies show an average increase of 10.3 per cent in gross earnings in 1917 over 1916. This is a larger percentage of increase than the average during the last ten years. The reports cover operations in thirty-nine states and in two provinces of Canada.

The banking firm's records for the last ten years show the following increases in gross earnings:

60	companies	in 1908 over 1907	by	7.3%
61	companies	in 1909 over 1908	by	11.3%
66	companies	in 1910 over 1909	by	12.0%
70	companies	in 1911 over 1910	by	9.3%
73	companies	in 1912 over 1911	by	8.6%
83	companies	in 1913 over 1912	by	7.4%
84	companies	in 1914 over 1913	by	2.9%
86	companies	in 1915 over 1914	by	2.8%
90	companies	in 1916 over 1915	by	10.4%
100	companies	in 1917 over 1916	by	10.3%

In commenting upon this showing the bankers say:

"It will be observed that the foregoing record shows uninterrupted annual increases in the aggregate gross earnings of these companies during the past ten years, the average annual increase being more than 8 per cent. In normal times, this tabulation alone might serve as an illustration of the stability of earnings of the well-established public utilities which, to speak generally, supply a service that is essential to the economic life of the communities in which they operate.

NET EARNINGS DECREASE ONLY 2.8 PER CENT

"Under present conditions, however, the statement is incomplete without the facts as to net earnings. These companies, in common with practically all others, have been confronted during the past year with the problems of increasing costs of labor and material and higher taxes. It is therefore most gratifying that the aggregate net earnings of the 100 companies from which we have received reports show a falling off during 1917 as compared with 1916 of less than 2.8 per cent. Furthermore, the aggregate 1917 net earnings amounted to more than two and three-quarters times the aggregate annual bond interest charges of these companies. We feel that this showing of earnings under adverse conditions is one of the most dependable indications of the desirability of public utility bonds for investment when selected with care."

Twin Cities Suffer from Higher Costs

Net Income Is Reduced More Than Thirty Per Cent By Rise in Operating Expenses and Taxes

The operating ratio, including taxes, of the Twin City Rapid Transit Company, Minneapolis, Minn., was 74.84 per cent for the calendar year 1917 as compared to 68.17 per cent in 1916. This change was due almost entirely to the increase in operating costs. The total revenues showed a slight decrease, but the operating expenses rose $468,876 or 7.5 per cent. As a result the net operating revenue decreased $475,064 or 12.1 per cent. This loss was enhanced by the increase of $208,099 or more than 29 per cent in taxes. The final result for the year was a loss of $699,497 or 31 per cent in net income. The full details are given in the accompanying statement.

During 1917 the company declared and paid the regular quarterly dividends aggregating $1,530,000, being at the rate of 7 per cent on the preferred stock and 6 per cent on the common stock. The balance carried forward on Dec. 31, 1917, was $1,285,804 as compared to $1,368,762 the year before.

The expenditures for additions and replacements during the year 1917 totaled $1,435,687. The gross passenger revenue per mile of single track operated was $22,519. The revenue passengers carried numbered 199,621,160, a slight decrease from the 199,848,096 in 1916; and the transfers redeemed were 73,678,873, a decrease from 74,425,935 the year before.

The city of Minneapolis in 1917 completed the valuation of the local property, and later had this valuation reviewed by another expert. On account of the generally disturbed conditions, however, the city is moving slowly with the franchise negotiations, but it is felt that progress is being made.

Financial News Notes

Receiver for Florida Road.—On May 3 the United States District Court in and for the Southern District of Florida appointed Charles M. Allen receiver for the St. Petersburg & Gulf Railway, St. Petersburg, Fla.

Seeks New Security Issues.—The Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has applied to the Public Service Commission for authority to issue $600,000 of bonds, to be sold at 90; and $200,000 of 7 per cent preferred stock.

Additions to Toronto Board.—The board of directors of the Toronto (Ont.) Railway was enlarged recently to provide for the addition of two new members and the president, Sir William Mackenzie, announced that Hugh Mackay, Montreal, and H. H. Pitts, Ottawa, have been appointed to fill the places.

Seeks Help to Meet Maturing Obligations.—Richard McCulloch, president and general manager of the United Railways, St. Louis, Mo., is reported to have left St. Louis for Washington to appeal to the capital issues committee, formed under the war finance corporation act, to assist the company in meeting $3,500,000 of Union Depot bonds, which are to mature on June 1.

Additions to Capital Account.—The East St. Louis (Ill.) Railway has filed with the Illinois Public Utilities Commission a petition asking for permission to increase the capital stock $210,300 and to issue $188,000 of first mortgage bonds. The proposed increase in capital stock is to reimburse the company for improvements made during the last two years.

Paid in Full.—Out of the proceeds of the sales of the collateral on Jan. 28 the holders of the $1,164,000 of 6 per cent five-year gold notes of 1914 of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind. received at the Central Trust Company, New York, $1,060.50 on each note, being payment in full of principal and accrued interest after payment of all costs and expenses.

Preferred Stock Offered.—Richter & Company, Hartford, Conn., are offering for subscription 7 per cent cumulative preferred stock of the Wisconsin-Minnesota Light & Power Company. The company has outstanding $4,622,000 of cumulative preferred stock, $2,500,000 of common stock, owned by the American Public Utilities Company and $8,925,000 of first and refunding 5 per cent bonds, including those reserved to retire underlying issues. There are also $808,000 of closed mortgage bonds outstanding issued against acquired properties.

New Accounting Classification Proposed.—Chairman Hill, of the Public Service Commission for the Second District of New York, has announced a conference on May 22 at 10 a. m. at the commission's office in Albany on the proposed new accounting classification for electric railways. The executive committee of the New York Electric Railway Association has requested a hearing, principally on requirements relating to depreciation accounting, and it is expected that some fundamental questions will be raised regarding the commission's policy in this important matter.

Dividend in Scrip.—The Middle West utilities Company, Chicago, Ill., has declared the regular quarterly dividend of 1½ per cent on the preferred stock, payable on June 1 to stock of record of May 20. The dividend is in scrip, payable in ten years, bearing interest at 6 per cent. The reason assigned for paying the preferred dividend in scrip is that inability to secure funds, except at prohibitive rates of interest, makes the conservation of the company's cash resources necessary to meet the expenditures for a constantly increasing gross business. The regular quarterly dividend of 1½ per cent was paid in cash on March 1.

Partial Abandonment.—Work has been finished tearing up 2½ miles of track of the Rutland Railway, Light & Power Company, Rutland, Vt., running from Castleton Corners to Lake Bomoseen. This material has been sold. The line was a summer line and has been operated in the past at a considerable loss, and it was decided after last season closed that it would be best to discontinue it entirely. This means a return to production of more than 300 tons of steel and the release of six or eight men for war purposes. The overhead wire will be taken down and used on worn-out portions of the local system, or transferred to other systems, as the wire is practically new.

INCOME STATEMENT OF TWIN CITY RAPID TRANSIT COMPANY FOR 1916 AND 1917

	1917		1916	
	Amount	Per Cent	Amount	Per Cent
Revenue from transportation	$10,119,755	99 4	$10,130,112	99.5
Revenue from other railway operations	62,111	0.6	57,941	0.5
Total railway operating revenue	$10,181,866	100 0	$10,188,054	100 0
Way and structures	$1,031,215	10.1	$1,057,234	10.4
Equipment	781,663	7 6	780,235	7.7
Power	1,047,484	10 3	880,081	8 6
Conducting transportation	3,031,122	29.8	2,725,760	26 8
Traffic	57,137	0 6	45,550	0 4
General and miscellaneous	816,845	8 0	808,472	7 9
Transportation and investment —credit	41,950	0 4	42,691	0 4
Total railway operating expenses	$ 6,723,519	66.0	$ 6,254,643	60 4
Net operating revenue	$3,458,346	34 0	$3,933,410	38 6
Taxes assignable to railway operation	916,196	8 0	708,097	6 9
Operating income	$2,542,150	25 0	$3,225,312	31 7
Income from unfunded securities and accounts	$24,145	0 0	$26,051	0 2
Miscellaneous income	1,700	0.0	373	0 0
Total operating income	$25,846	0 2	$26,425	0 2
Gross income	$2,567,996	25.2	$3,251,738	31.9
Rent for leased roads	3,000	0 0	3,000	0.0
Interest on funded debt	989,724	9 7	984,557	9.7
Net loss miscellaneous physical property	25,586	0 3	18,621	0.2
Miscellaneous debits	11,635	0 1	8,011	0.1
Total deductions from gross income	$1,029,946	10.1	$1,014,190	10.0
Net income	$1,538,050	15.1	$2,237,547	21.9

Would Borrow $1,500,000.—The New York State Railways, Rochester, has filed with the Public Service Commission for the Second District, a petition in which it asks authority to negotiate a loan from the War Finance Corporation of an amount not to exceed $1,500,000 for five years or less upon such terms and subject to such rules and regulations as may be prescribed by the War Finance Corporation's directors. The company also asks permission to issue its fifty-year first consolidated mortgage gold bonds, bearing interest at 4½ per cent, to an amount sufficient to realize $2,230,905 at such price as may hereafter be approved by the commission, and that permission be granted to issue and pledge as collateral security to its loans, with the War Finance Corporation or others, $2,500,000 par value of the bonds.

St. Louis Tax Value Fixed.—The taxable valuation of the United Railways, St. Louis, Mo., was placed at $54,086,648 in a return made on April 13 to the State Tax Commission at Jefferson City. The company also made returns on the property of the St. Louis & Meramac River Railroad at $2,318,915 and the Missouri Electric Company—St. Charles Line—at $989,532. The total assessable property, including the subsidiary companies, amounts to $57,395,095. The return was more than double the valuation of last year, which was fixed by the State Board of Equalization at $21,925,786. That figure included the valuation of the company's franchise, which is not taxable and was not included in the latest return. The mileage of the company was placed at 423.1. The new valuation of the St. Louis & Meramac River Railroad quadrupled the return of last year. The return gave the mileage at 31.7. The taxable valuation of the St. Charles line last year was placed by the State board at $571,108. The United Railways has $1,619,000 of unassessable bonds.

New Publications

Financial Statements Made Plain

By Earl A. Saliers. Magazine of Wall Street, 42 Broadway, New York, N. Y. 96 pages. Cloth, $1.06 postpaid.

This is not an exhaustive study in regard to the technical analysis of financial statements, but it is a very readable discussion of the general principles of income-statement and balance-sheet interpretation which ought to be known by investors. Upon the mind of the average investor the book should have a clarifying and a stimulating effect. Particular attention should be directed to one observation by Mr. Saliers, i.e., that the investor should enlighten himself as to the general policy on depreciation followed by the company whose securities he contemplates buying. This is true, of course, but on this point it might be added that the public should realize more fully the need of providing rates sufficient to permit adequate treatment of depreciation.

A Bibliography of Municipal Regulation and Municipal Ownership

By Don Lorenzo Stevens. Harvard University Press, Cambridge, Mass. 410 pages. Cloth, $4 net.

This volume makes readily available to busy men information regarding the best books and articles up to Jan. 1, 1917, on the subject of regulation and municipal ownership. Covering as it does traction, electric, gas and water utilities in all their numerous regulatory phases, the book should be a valuable *vade mecum* to commissioners, operators, lawyers and others interested in the public utility industries of the country. The amount of literature on utility topics has grown to such an enormous size that some special classified index to it has become a necessity. Mr. Stevens' compilation fills the need very well. Not a little credit is due to him because of his reading of all the works listed and his insertion of brief critical annotations to facilitate the selection of material.

Cost Accounting—Theory and Practice

By J. Lee Nicholson. Ronald Press Company, 20 Vesey Street, New York, N. Y. 341 pages. Half leather, $4.

This book is most commendable because of the clear-cut way in which it charts the whole structure of cost accounting. In the midst of so many dissertations on the benefits of organization and efficiency, it is a distinct pleasure to read a book which tells so simply *how* to secure these results through cost accounting.

Mr. Nicholson conceives all cost accounting systems, no matter how involved, to be reducible to four types, as follows: the special order system, using the productive labor method; the special order system, using the process or machine cost method; the product system, using the productive labor method, and the product system, using the process or machine cost method. What differentiates these systems; when and how they are used; how they should be combined under special conditions—all this information Mr. Nicholson presents.

The author also explains how a plant should be examined before a cost system is installed, and he includes eighty basic forms as suggestive material. The book is well organized, and the reader can hardly fail to secure a better knowledge of the mechanism of cost accounting.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$76,107	*$47,448	$28,659	$19,621	$9,038
1m., Mar., '17	71,203	*40,566	30,637	18,646	11,991
12m., Mar., '18	892,825	*527,164	365,661	231,360	134,301
12m., Mar., '17	852,166	*480,146	372,020	218,071	153,949

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Mar., '18	$151,533	*$112,174	$39,359	$30,747	$8,612
1m., Mar., '17	106,691	*74,631	32,060	29,753	2,307
12m., Mar., '18	1,467,675	*1,249,296	218,379	362,665	†144,286
12m., Mar., '17	1,248,917	*858,529	390,388	358,238	32,150

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

1m., Mar., '18	$362,526	*$250,474	$112,052	$55,779	$56,273
1m., Mar., '17	332,389	*237,777	94,612	45,109	49,503
12m., Mar., '18	4,115,470	*3,068,439	1,047,031	586,892	460,139
12m., Mar., '17	3,657,467	*2,287,687	1,369,780	520,841	848,939

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY GRAND RAPIDS, MICH.

1m., Mar., '18	$1,756,688	*$1,176,802	$579,886	$488,934	$90,952
1m., Mar., '17	1,558,538	*971,164	587,374	431,079	156,295
12m., Mar., '18	20,093,104	*13,099,519	6,993,585	5,440,473	1,553,112
12m., Mar., '17	17,545,338	*9,939,686	7,605,652	5,084,279	2,521,373

GRAND RAPIDS (MICH.) RAILWAY

1m., Mar., '18	$108,918	*$82,553	$26,365	$19,148	$7,217
1m., Mar., '17	112,733	*75,658	37,075	17,456	19,619
12m., Mar., '18	1,292,745	*924,762	367,983	224,178	143,805
12m., Mar., '17	1,310,494	*855,330	455,164	196,711	258,453

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$587,791	*$284,257	$303,534	$217,937	$85,597
1m., Mar., '17	544,365	*244,614	299,751	218,865	80,886
3m., Mar., '18	1,702,657	*855,716	846,941	652,621	194,320
3m., Mar., '17	1,583,460	*710,273	873,187	651,299	221,888

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m., Mar., '18	$218,584	*$141,476	$77,108	$40,980	$36,128
1m., Mar., '17	201,328	*137,091	64,237	40,906	23,331
12m., Mar., '18	2,471,564	*1,600,615	870,949	489,600	381,349
12m., Mar., '17	2,415,890	*1,494,407	921,483	503,298	418,185

NEW YORK (N. Y.) RAILWAYS

1m., Mar., '18	$982,684	*$793,913	$188,771	$285,331	††$46,726
1m., Mar., '17	1,051,492	*884,491	167,701	284,261	††69,959
9m., Mar., '18	8,984,526	*6,898,075	2,086,451	2,548,203	††6,338
9m., Mar., '17	8,356,205	*6,763,177	1,593,028	2,536,386	††464,271

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m., Mar., '18	$621,145	*††$372,058	$249,087	$178,148	$70,939
1m., Mar., '17	474,478	*262,377	212,101	184,024	28,077
12m., Mar., '18	6,387,407	††*3,855,196	2,532,211	2,139,509	392,702
12m., Mar., '17	5,592,604	*3,038,892	2,553,712	2,180,643	373,069

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH

1m., Feb., '18	$919,288	*$568,365	$350,923	$206,221	$144,702
1m., Feb., '17	720,177	*440,390	279,787	189,142	90,645
12m., Feb., '18	9,826,191	*6,098,760	3,727,431	2,380,832	1,346,599
12m., Feb., '17	8,348,610	*5,168,424	3,180,186	2,227,602	952,584

* Includes taxes. † Deficit. ‡ Includes non-operating income. †† For one month $18,732 and for twelve months $234,320 included for depreciation.

Traffic and Transportation

Skip Stop for Bay State

Fuel Administrator Recommends It and Public Service Commission Promptly Indorses the Plan

James J. Storrow, fuel administrator for New England, has requested all the electric railways of Massachusetts to eliminate all unnecessary stopping places on their lines by the adoption, as a war measure, of the skip-stop plan. The maximum number of stops per mile permitted under ordinary conditions will be eight in urban districts, six in suburban and four in interurban territory. It is estimated that a possible yearly saving of more than 100,000 tons of coal can be made in Massachusetts by this plan. The fuel administrators of the other New England States are in sympathy with the skip-stop program and it is expected that they will issue similar requests to their local companies.

TEXT OF MR. STORROW'S LETTER

The text of Mr. Storrow's letter, addressed to the heads of the electric railways in Massachusetts is as follows:

"Improved weather conditions have temporarily relieved the acute coal shortage of last winter. We must all realize, however, that the outlook for next winter's steam coal supply is extremely serious and that there is likely to be an insufficient supply of coal throughout the war.

"To meet this situation all steam coal users should do their utmost to get the maximum efficiency from the coal that is available, and the electric railways must do their share.

"Every time a car is stopped and started much power is used. We therefore request all electric railways, in so far as local conditions may reasonably permit, to reduce the number of stopping places in urban districts to not more than eight to a mile, in suburban districts to not more than six to the mile, and in interurban districts to not more than four to the mile.

"This so-called skip-stop system has already been put into effect on several large electric railway lines with excellent results. In many cases it has reduced the total amount of coal consumed by these companies more than 20 per cent. At the same time the service to the public has been actually improved as it has resulted in materially speeding up the cars, reduced delays, and in general increased the efficiency of the service. This has been especially so in rush hours and in crowded districts.

"City and town officials will be urged through our local fuel committees to co-operate with the electric railways in putting this measure into effect."

Chairman Macleod's letter addressed to Mr. Storrow expresses the attitude of the Public Service Commission with respect to the proposal of the Massachusetts Fuel Administration. It reads:

"In response to your inquiry I take pleasure in saying that this commission approves of the general principle of reducing the number of stopping places on electric railway lines, provided such reduction is confined within reasonable limits. It has been amply demonstrated not only in other parts of the country but in this State, that the limitation of stops will result in a substantial saving of power, and hence of fuel, and that it may actually improve, rather than impair, service. This has been the case in Cleveland and other cities where it has been tried. Frequent stops mean slow service. By limiting the number of stops, running time can be reduced and people carried more quickly to their destinations. By the use of the skip or staggered stop system any inconvenience from such limitation can be minimized. The commission is of the opinion that on many electric railways in this Commonwealth a reduction in the number of stopping places, if reasonably and carefully made, is desirable, especially under existing conditions."

Would Charge Six Cents in Trenton

The Trenton & Mercer County Traction Corporation on May 10 petitioned the Board of Public Utility Commissioners of New Jersey for the right to increase its fares from 5 cents to 6 cents on all the Trenton divisions and the suburban lines. The company has been seeking for some time to do away with the sale of tickets at the rate of six for a quarter and charge a straight 5-cent fare, but has been unsuccessful.

The petition sets forth that, based upon the cost of operation at present prices for labor and materials, the deficit for this year will be $212,160. With contemplated additions to capital expenditures, wage increases, etc., the deficit would be further increased for the present year by $85,000, making the total deficit $297,160, at the present rate of fare, in case the additional expenditures are made.

The company declares that in case the appeal for increased fare rates is granted, it is the desire of the corporation to further increase the amount set aside annually for depreciation by $25,000, making its total appropriation for this purpose $175,000.

Statements of the company affixed to the petition show that the total wages to be paid to employees from the superintendent down for the present year will amount to $402,244 and exceed by $109,086 the total expended in wages in 1914.

Six-Cent Fare for St. Louis

Missouri Commission Split Three to Two on Questions of Jurisdiction and Adequacy of Fare

The State Public Service Commission of Missouri at Jefferson City, on May 11, by a vote of three to two ordered fares on the lines of the United Railways in St. Louis to be raised from 5 cents to 6 cents.

NEW RATE EFFECTIVE ON JUNE 1

The new rate goes into effect on June 1 and will continue for one year unless changed by a subsequent order of the commission, or by an appeal by the city of St. Louis to the courts. Universal transfers will be issued, as at present, without additional cost. Half-fare tickets will be sold at the present rate of 2½ cents each. The company is required to place tickets on sale at convenient points throughout the city, in blocks of five, ten and 100 individual fares.

The opinion and order of the commission contain about 20,000 words. The majority opinion concerns itself with two points. The first is whether the commission has the authority, under the constitution, to act in the case, and the second is whether the United Railways operating with the present fares would be able to meet its operating expenses, pay its debts and grant a wage increase to its employees. On the question of jurisdiction the opinion holds that the commission has the power to act and cites authorities.

In considering the second point, namely, the inadequacy of the fare that has been in effect, the financial and physical condition of the property, as shown by the reports of City Engineer Smith, officials of the United Railways and experts of the Public Service Commission, is analyzed and the conclusion is reached that the revenues of the company, on the present basis, would be insufficient during the coming year, especially in view of the fact that no relief would be afforded by the so-called compromise franchise ordinance recently passed and approved, within the year that the fare increase is to remain in effect.

COMMISSION RETAINS JURISDICTION

The company is ordered to make monthly reports to the commission, showing its gross earnings and operating expenses under the new system. The commission retains jurisdiction of the case, and may change the fare schedule after its engineers and accountants complete a valuation of the property. The commission has determined to make such a valuation during the coming year. In the present case the commission took $52,800,000 as the value of the property.

Richard McCulloch, president and general manager of the company, said that he would make no statement whatever in regard to the decision of the commission until he had received an official copy of the opinion and had time to read and digest it.

Winnipeg Abolishes the Jitneys

Details Are Given of the Resolution Adopted by the Council and of the Proposal of the Winnipeg Electric Railway

The jitney in Winnipeg (Man.) is no more. By a vote of twelve to five the City Council decided during March on its abolition, but several weeks elapsed before the motion was put into effect. This delay was caused by extreme amendments being proposed to the by-law, which was to eliminate jitneys by May 1. These amendments the company could not accept. The by-law was finally passed on April 29, and 200 jitneymen sought new occupations the following day.

SETTLEMENT AT FIRST DELAYED

The jitneys would have been abolished a month earlier, but certain Aldermen pressed for the insertion of a clause in the agreement accompanying the by-law, to the effect that "at no future time shall the company apply for an increase in fares." The company declared it would let the whole negotiations fall through rather than submit to that clause, and finally a clause was inserted which left the situation as it was before the fares clause question was raised. Many other amendments, such as "no seat no fare," "abolition of all running boards on cars," etc., were proposed by Aldermen, but all these were finally defeated. The by-law went through Council by a vote of ten to eight.

In one district, Westminster Avenue, which is at present not served by the Winnipeg Electric Railway, the company offered to run a motor bus service. A clause was also inserted in the agreement permitting the company to do this and to run motor buses in other parts of the city where railway lines have been ordered by the City Council.

RAILWAY BETTERS SERVICE

Following the elimination of the jitneys the railway has placed a new type of car in service. It is a remodelled car, provided with safety step, front exit, and lower car body. It is the intention of the company to remodel all its cars along these lines. The company is also putting into service immediately four trail cars, remodeled from old rolling stock. Other trail cars will be purchased in the near future.

The course run by the jitney in Winnipeg varied very little from that of the vehicle in other cities where it received a free hand. Electric railway traffic suffered severely and the matter took on a serious aspect for the Winnipeg Electric Railway. Much discussion followed in regard to the respective right of the railway and the jitneys, and finally suit was brought by the electric railway claiming $1,000,000 damages. As one of the conditions of the present settlement the company has agreed to withdraw that suit.

The text of the settlement motion as adopted by the Council is as follows:

"That the city solicitor be instructed to prepare a by-law prohibiting the operation of jitneys in the city.

"That the city solicitor prepare an agreement between the city and the Winnipeg Electric Railway binding the company to fulfill the conditions set forth in the manager's letter of March 25 to the City Council, such agreement to contain a provision for the payment of at least $25,000 per month to the credit of a joint account of the city and the company in the Bank of Montreal to be checked out on the joint authority of both the city and the company and to be used for the purpose of:

"1. Providing adequate and efficient electric railway service.

"2. Meeting expense of grounding secondaries.

"3. Clearing streets of useless poles.

"4. Protecting high potential wires to prevent accidents.

"5. Eliminating electrolysis damage, and any other expense or outlay to carry out the terms of the agreement.

"The payment in to such fund is to continue until it is decided by the public utilities commissioner that the company's obligations under the agreement have been carried out.

"It is distinctly understood, however, that the company under the terms of any agreement shall not have the right to operate within the city a system of motor busses without the consent of the Council and upon such streets as the Council may prescribe, such service shall be supplementary to the service of the company as a temporary means of giving the public adequate facilities, but shall in no sense be exclusive, it being distinctly understood that the company is not to have any greater privileges or rights than already given it by by-law 543, any contract not to extend beyond Feb. 1, 1927.

"The license inspector is directed to issue no licenses in respect to automobiles for hire pending negotiations with the Winnipeg Electric Railway, and the details of preparation and revision of contract with the said company are referred to the board of control."

THE COMPANY'S LETTER

The letter of the company dated March 25, to which reference is made in the resolution of the Council, was as follows:

"Upon the elimination of jitneys in the city of Winnipeg the company agrees as follows:

"1. Service: The company will furnish the citizens of Winnipeg adequate transportation facilities, and will at once proceed to remodel its present rolling stock, making the cars modern in every respect, with folding steps, proper front exits, latest type of lighting and improved route signs.

"2. Trailers: Center entrance, modern trail cars will be used in conjunction with extra cars during the rush hour periods.

"3. Motor buses and extensions: The company will forthwith put on motor buses to provide service on Westminster Avenue as part of its system, with the same rates of fares, transfer privileges, and will continue to operate same until it extends its car lines to serve this community and will also extend the Sargent Avenue line, 2200 ft.

"4. Percentages: The company will forthwith pay the city the 1917 percentages of gross earnings and car tax, amounting to $105,777.

"5. Million dollar suit: The company will withdraw the letter written to the city on April 4, 1917, claiming $1,000,000.

"6. Electrolysis: The company will proceed to institute and carry out the system of insulated return feeders in accordance with the recommendation of Professor Ganz, as embodied in the act passed by the Legislative Assembly.

"7. Electrolysis damages: The company will settle the action now pending by the city against the company for damages claimed to the city's water mains and underground structures by electrolysis, caused by the operation of the company's system in Winnipeg, by consenting to judgment being given in favor of the city for such an amount as shall be found to be due to the city by the company, such amount to be fixed by a referee to be appointed by the court.

"8. Grounding of secondaries: The company will perform and carry out order No. 105 of the Public Utilities Commission of Manitoba relating to the grounding of secondaries.

"9. Abandoned poles: The company will remove at its own expense from the streets of the city all poles which it may have abandoned.

"10. Span wires: The company will, in the business section of the city, wherever there are suitable buildings for the purpose, and permission can be obtained from the owners, transfer its span wires to such buildings.

"11. Steel poles: Wherever, in the business section of the city, wooden poles are worn out or have to be replaced, the same will be replaced with steel poles."

Although there were nearly 200 jitneys in operation in Winnipeg prior to May 1 their elimination has not caused any outcry, and transportation matters have adjusted themselves quickly to the new conditions.

Final Schedule Order Issued

The Public Service Commission for the First District has adopted a final order directing the Brooklyn Heights Railroad and other companies of the Brooklyn Rapid Transit System operating surface car lines, to file operating schedules with the commission and to post in the cars placards giving the "headway" and service called for in the schedule. These schedules must show the route, the car run numbers, the terminals and car depots.

Public Service Hearings Progressing

City Counsel Cross-Examines Company Witnesses on Various Points —Commission Counsel Interested in Modified Zone Systems

Hearings on the application of the Public Service Railway, Newark, N. J., for a 7-cent fare, a 2-cent charge for transfers and a 1-cent charge for second transfers were continued on May 11, 13 and 15. The resumption of the hearings was noted in the ELECTRIC RAILWAY JOURNAL of May 11.

Prof. Roswell C. McCrea of Columbia University, upon cross-examination by city counsel, explained the labor situation throughout New Jersey. He said that two interesting studies of increased living costs of workmen in the Newark and Camden shipbuilding districts had recently been completed, and that the data collected showed a rise of 40 per cent in the family cost of living.

Professor McCrea was of the opinion that the estimated decrease in traffic under higher fares would not be due to any inability on the part of some workmen to pay the higher rates out of their higher wages, but to their unwillingness to do so. He stated that the amount disbursed by workmen for transportation is a very small percentage of their income. As for the possibility of holding men in electric railway employment, the witness felt that the wages could be somewhat lower than those paid in shipyard work, on account of the permanency of railway employment.

QUERIES ABOUT ZONE SYSTEMS

Under examination by counsel for the Board of Public Utility Commissioners the next witness, Prof. Albert S. Richey, of Worcester Polytechnic Institute, outlined the physical features of the zone or mileage systems used by the Springfield Street Railway, the Rhode Island Company and the Massachusetts Northeastern Street Railway, and proposed for the Bay State Street Railway.

Regarding the success of the 6-cent fare in Massachusetts, Professor Richey stated that the flat increase had in some cases been disappointing. In the case of the Bay State Street Railway it did not give sufficient revenue. It would have given enough at the time the application was made, but when relief was granted after a year unanticipated rising prices had become prevalent. Now it is believed that the proposed mileage system will give more revenue. A 6-cent fare on the Boston & Worcester Street Railway took care of the company for a year, but in the last year the prices rose and additional revenue was needed. The company went to a mileage system because it felt that this would give more revenue than a 7 or 8-cent fare.

Professor Richey expressed his belief in the general idea of a service-at-cost plan, but stated that he did not agree with every detail of specific plans. In his opinion, an increase in fare is absolutely necessary, and a single adjustment of fares will not settle the matter permanently.

As to the practicability of a modified zone system in Public Service territory, Professor Richey remarked that the institution of such a system would not be impossible, and that it would be more equitable and ideal when fully developed. Serious difficulties, however, would have to be overcome in working out such a system, first in relation to fare collection and second in relation to the establishment of zone boundaries. The fare collection problem on congested lines in urban territory would be particularly difficult to solve.

PRESIDENT MCCARTER TESTIFIES

Thomas N. McCarter, president of the company, was then examined at length concerning various phases of the application. He explained that the relief desired was for emergency use only, and that the question of terminating the higher rates should be left to the commission for decision in the light of the then existing conditions.

Marshall Van Winkle, city counsel, questioned Mr. McCarter in detail regarding the organization and functions of the Electric Railway War Board and other utility committees in Washington, and asked whether the recent letters of President Wilson and Secretary McAdoo on the subject of needed utility relief had not been "promoted" by utility representatives. Mr. McCarter deprecated the insinuation and said that the letters were the patriotic expression of deliberate judgment based on accurate data.

Mr. Van Winkle stated that Jersey municipalities did not disagree with the letters but would not consent to the granting of relief to the Public Service Railway when it had refused to place its case before the "local" authorities. Mr. McCarter explained that formerly it would have been a waste of time to try to secure concerted action from the 146 communities served, and that now, with the recent Collingswood decision giving the State commission control over franchise rates, the only sensible emergency procedure was to apply to this board for relief.

Mr. McCarter said that the new line to the Port Newark shipyard is under construction. At first there was a slight misunderstanding, on the part of the Shipping Board in regard to this matter. The contract with the government was based upon the securing of a franchise with certain conditions, but upon application to Newark officials the latter wanted the company to proceed with construction without any guarantee that a franchise upon the stipulated terms would be forthcoming. Upon learning the full details of this, however, Admiral Bowles straightened matters out with the city officials; the desired franchise is in process of being granted, and the construction of the line has been begun. Mr. McCarter added that a contract has now been signed for the railway development for the Camden shipyard district.

Geneva Hearing Is Closed

The Public Service Commission for the Second District of New York on May 1 heard the application of the Geneva, Seneca Falls & Auburn Railroad Company, Inc., for permission to increase its rate of fare from 5 to 6 cents in the zone including Geneva and a part of Waterloo. This is one of the company's five fare zones. L. G. Haskins, secretary of the railway, testified that franchises in Geneva and Waterloo contain no fare restrictions. T. H. Werry, auditor, presented a series of statements relating to the affairs of the company from 1913 to 1917.

The company has never paid a dividend on its stock, said Mr. Werry, and it is difficult to pay interest on the bonds from the present earnings. The wages of the men were recently increased from 28 to 30 cents, and it is understood that the men intend to ask for 35 or 40 cents about July 1, when the present agreement expires. Just now, too, there is a lack of ballast, and the company has been ordered to repave one street in Geneva.

There was no opposition to the petition of the company, and Chairman Bill declared the hearing closed. Immediate action will probably be taken by the commission.

Six-Cent Fare Wanted for Hudson

The Public Service Commission for the Second District of New York on April 25 held a hearing on the question of the dismissal of the Albany Southern Railroad fare petition under the recent decision of the Court of Appeals. James E. Hewes, general manager, appeared for the company and Corporation Counsel Boothby represented Rensselaer.

Mr. Hewes announced that the company had abandoned its application as far as it related to Rensselaer. He said the company was operating in Rensselaer and Albany on the tracks of the United Traction Company under a contract. He argued, however, for a 6-cent fare in Hudson, stating that the company was not making an adequate return upon its investment there.

The company's books showed a deficit of $4,000. On the basis of a charge of one-half of the physical valuation of the company's property in Hudson, he said that there was a net deficit of $2,000. This, with a 2.6 per cent depreciation, made a deficit of $4,600.

Mr. Hewes said he did not anticipate that an increased fare would cause a falling off in the revenue, as the Hudson line was largely an accommodation line, the majority of the people there walking. There is only one small industry on the car lines. There was no appearance on the part of Hudson before the commission.

Unique Car Crew in Unique Service

Ever since the start of the campaign by the government for the sale of thrift stamps the Manhattan & Queens Traction Corporation has been one of the leading boosters of the scheme among the electric railways. It would seem, however, that the company has about



UNCLE SAM AND MISS COLUMBIA

reached the ultimate in its work of selling the stamps by the introduction of a red, white and blue car whose motorman, Uncle Sam, and conductoress, Miss Columbia, sold $1,500 in thrift stamps in one day recently.

The Manhattan & Queens Traction Corporation operates 22 miles of road between the Manhattan end of the Queensboro bridge at Fifty-ninth Street, New York, and Jamaica, L. I. The car on which Uncle Sam and Miss Columbia serve has naturally attracted an immense amount of attention, and the enterprise of the company has been commented upon favorably by the local public and by New York and out-of-town newspapers. The accompanying illustrations of the thrift car and its crew give an idea of the lengths to which the company has gone in its effort to help the government in the thrift-stamp campaign.



FULL VIEW OF THE CAR AND ITS CREW

Housing and Service Departments of E. F. C. Merged

Announcement was made on May 13 of the abolition of the housing department of the division of general service, and the passenger transportation service section as distinct units of the Emergency Fleet Corporation and their consolidation into one department to be known as the division of passenger transportation and housing.

A. Merritt Taylor has been named director of the new division of passenger transportation and housing. He has appointed J. Willison Smith as assistant director of housing and J. Rogers Flannery as associate director of housing, to act with him in connection with the housing problems. Garrett T. Seely, formerly assistant manager of passenger transportation, has been appointed assistant director of passenger transportation by Mr. Taylor, to act with him in handling the passenger transportation problems of the division.

The jurisdiction of the new division is as follows:

1. To determine upon and take such measures as may be necessary to relieve deficiencies in passenger transportation facilities serving shipyards and plants throughout the United States, which hold contracts with the Emergency Fleet Corporation.

2. To determine what housing developments are required to expedite ship construction for the Emergency Fleet Corporation, to designate the character thereof and to establish the same.

3. To secure, either by purchase, condemnation, requisition or otherwise, such land, property, franchises and facilities as may be required for those purposes.

Second Kansas City Hearing Held

Another hearing of the Kansas City (Mo.) Railways fare case on May 9, before the Public Service Commission, was occupied chiefly with the presentation of the city's opposition to the company's application. The purpose of the city was obviously to minimize the influence of figures presented by the company. The net effect, however, was to give the city officials very explicit information as to the many unexpected burdens which the company has to bear.

The city attorneys particularly asked P. J. Kealy, president of the company, in what way resources might be increased besides by a flat increase in fare. Colonel Kealy related the many studies made by the company on this subject. He mentioned the studies of zoning, for instance, and pointed out that with a 4-mile zone for a 5-cent fare only $90,000 would be realized by collecting an extra cent from those outside the zone. Even a 25-cent fare on owl cars, he said, would make no appreciable difference, since the revenue from some of the owl lines was only $2 a week each. As for a transfer charge, Kansas City is not laid out in such a way as to distribute the burden equitably on the public by this means. Colonel Kealy said that eventually electric railway operation must come to the zone system, so that each passenger will pay for the service he receives.

Colonel Kealy stated that the company had not estimated the amount of increase in fare necessary, but it is putting the evidence before the commission for decision. The question was asked as to whether the increased fare would continue if the war should end soon and conditions be restored to normal. He answered that the experience of the last few months had discouraged anybody from making predictions. He declared, however, that the company had to forego a fair return on the investment during the period of the war; but that, as the franchise provides, if better times should come, the stockholders would be entitled to receive the dividends foregone.

The company introduced a copy of resolutions adopted by several civic organizations. Some of the organizations made the resolutions stronger, but most adopted these conclusions:

"We recommend that such decisive action be taken as will permit an increase of the wage scale and the continuance of good service and leave it to the judgment of the Public Service Commission, to whom all facts will be presented, as to whether these ends can be accomplished by other than an increase in the revenue, and if not, we believe the revenue should be increased."

Briefs will be exchanged, and the next hearing, which may be the final one, will be held at Jefferson City on May 27.

Wants Fare Increase in Buffalo

Application has been made to the City Council of Buffalo, N. Y., by the International Railway for permission to increase fares on its lines within the city. The company fixes no tentative rate, but in an interview Henry W. Killeen, of Penney, Killeen & Nye, of counsel for the railway, says a 6-cent fare is absolutely essential.

The company operates under a franchise known as the Milburn agreement. This was made at the time the railway properties of the city were consolidated. Included in the agreement is the provision that a 5-cent fare must be charged with free transfers. In order to obtain permission to increase its rate of fare, the company must secure the consent of the City Council and the new rate must be ratified by the voters of Buffalo at a general or special election. The rate is also subject to review by the Public Service Commission.

The company started a publicity campaign in advance of the filing of the formal petition with the Council. This publicity held that the value of the nickel is now less than 50 per cent of what it was before the war and therefore the company is carrying passengers for about 2 cents.

The Mayor was elected a year ago on the platform of railway reform and has attacked the company on many occasions. In replying to these attacks, the railway closed one of its advertisements with this paragraph:

"And yet some men, whose motives seem to be revenge rather than civic betterment, have apparently learned nothing by reading of the conditions Lenine and Trotzky have brought in Petrograd."

Henry W. Killeen, of counsel for the company, says that unless the company is granted an increase in fare, it will be forced into the hands of a receiver.

Zones the Only Way Out

C. V. Wood, vice-president of the Milford, Attleboro & Woonsocket Street Railway, appeared before the Public Service Commission of Massachusetts at Boston on May 6 in support of a zone system of fares. He informed the commission that unless the company was permitted to increase its revenue it would be necessary to tear up the road and sell it for junk. The company needed $170,000 a year more revenue. Mr. Wood said that it would be necessary to charge a flat rate of 8½ cents if the company were to maintain the system of a single fare unit. It was believed that a zone system offered a better solution of the problem. F. H. Dewey, president of the company, said that the company was doing a fair freight business but no great amount of revenue was in sight from this service. Commissioner Eastman suggested that higher freight rates were to be expected on electric railways. He recommended that the company sell a park valued at $28,000 because the capital invested was yielding no return.

Transportation News Notes

Canadian Road Wants Increase.—The Moncton Tramways, Electricity & Gas Company, Moncton, N. B., has applied to the City Council for permission to increase the fares charged on the electric railway.

Increase for West Virginia Road.—The Union Traction Company, Sistersville, W. Va., has been granted authority by the Public Service Commission to increase its rates between Sistersville and New Martinsville from 20 cents to 25 cents each way.

Passenger Rates Increased.—The Public Utilities Commission of Ohio has approved an increase from 2 cents to 2½ cents a mile on the Cleveland & Chagrin Falls and the Cincinnati, Milford & Loveland Traction lines. The increases became effective as of May 1.

Amends Fare Plea.—The West Penn Traction Company, Pittsburgh, Pa., has filed a petition with the Public Service Commission for permission to amend the new tariffs at McKeesport, Pa., so that in addition to straight 5-cent fares, six tickets may be sold for 25 cents, without transfer privilege.

Omaha to Ask Six Cents.—The Omaha & Council Bluffs Street Railway, Omaha, Neb., has announced that it will apply to the Railroad Commission of Nebraska for permission to charge a 6-cent fare in Omaha. The 1-cent increase, if granted, will make the fare to Council Bluffs 11 cents instead of 10 cents.

Receiver Sees the Light.—C. A. Fagan, one of the receivers of the Pittsburgh (Pa.) Railways, favors a new rate of fares based upon the zone system. In a statement, Mr. Fagan pointed out the unfairness in the present fare system. He said it was absurd to charge the same fare for a ride to Soho as to Wilkinsburg. Fares in Pittsburgh are now 5½ and 6 cents.

Merchants Favor Increased Fare.—The Merchants' Association of New York announced on May 12 that it favored 6-cent fares on the subway lines of New York City. Its decision was based on the report of the committee on city traffic of the association, of which H. H. Porter is chairman, which asserted that the present fare was resulting in deficits greatly reducing the city's ability to borrow.

Fits the Service to the Fare.—The Southwestern Traction & Power Company, operating between New Iberia and Jeanerette, La., has filed with the Railroad Commission of that State a petition for authority to reduce its operations 50 per cent by having its cars leave each of these towns every two hours instead of every hour, as heretofore. The company pleads poor business and very high operating costs.

Inquiry Into Recent Accidents.—The Public Service Commission of the First District of New York announced on May 13 that it would begin on May 17 an investigation into the accidents that have recently occurred at various places in the city, and that special attention would be paid to the Union Railway lines, where one person was killed and several seriously injured a few days ago.

Skip Stops in Downtown Dallas.—The Dallas (Tex.) Railway on May 6 inaugurated the skip-stop system on all lines in the downtown business district and on Ervay Street and Colonial Avenue. If the plan is found to work satisfactorily, it will be extended to other lines. Signs have been placed at corners, and large display advertisements were published in the Dallas newspapers telling patrons how the plan would be carried out.

Hartford's Appeal Presented.—The city of Hartford, Conn., on May 7 filed with the Superior Court its appeal from the action of the Public Utilities Commission in denying the petition of the city for an order requiring the Connecticut Company to restore fares to 5 cents within the limits of Hartford and the towns immediately adjoining. The points made by the company are largely the same as those reviewed in the ELECTRIC RAILWAY JOURNAL for April 27, page 830.

Rules for Women Employees in Wisconsin.—A decision in the case brought by labor organizations to prevent the employment of women as drivers and conductors on street cars has been rendered by the Wisconsin Industrial Commission, ordering that no woman be employed on night runs and that under no circumstances shall their employment continue for more than eight hours a day. The runs on which women are employed must begin after 8 a.m. and terminate before 5 p.m., or within a period of nine hours.

From Five to Seven-Cent Zones.—A hearing will be held on May 21 before the Public Service Commission of Maine on the application of the Lewiston, Augusta & Waterville Street Railway for permission to increase its zone charges from 5 cents to 7 cents. This is an emergency application. The company did not earn its operating expenses for the first quarter of 1918. It is also beset by the prospect of higher interest on obligations maturing in 1918 and a new wage scale. Some time ago the property was re-zoned, ten 5-cent fares being substituted for seven 5-cent zones in one instance.

Fare Petition Withdrawn.—The Public Service Commission for the Second District of New York has closed the matter of the petition of the Elmira Water, Light & Railroad Company for permission to increase passenger fares in Elmira. Ross M. Lovell, attorney for the company, filed a letter with the commission withdrawing the petition and asking that the proceeding be dis-

continued. The petition asked authority to increase a 5-cent fare to 6 cents in cities and villages. No special hearing was held on the merits of the Elmira petition, but on April 18, after the decision of the Court of Appeals in the Rochester case, a hearing was held in relation to whether or not there is a franchise limitation in Elmira with respect to the rate of fare to be charged there by the company.

Fare Conferences in Albany.—At the conference on May 11 of representatives of the Chambers of Commerce or Boards of Trade of Albany, Rensselaer, Troy, Watervliet, Cohoes, Green Island and Waterford with officials of the United Traction Company negotiations were opened with a view to adjusting the differences that have arisen over the company's new schedule of intercity rates recently filed with the Public Service Commission. It was agreed temporarily to take up the question of 6-cent fares for all communities. In return for this, if the additional 1-cent fare can be instituted, H. B. Weatherwax, representing the United Traction Company, agreed to withdraw the tariffs filed recently imposing 10-cent and 15-cent fares on nearly all interurban trips.

Atlanta Committee Opposed to Rate Advances.—The committee of council members and citizens appointed by the City Council to investigate the petition of the Georgia Railway & Power Company, Atlanta, Ga., to the Railroad Commission for increased rates in all departments submitted its initial report to the Council on May 5. After reviewing the capitalization, corporate history and earnings of the company the committee says that the table of earnings which it presents "shows a healthy growth and one that should be wholly satisfactory to those who own and operate the power company." In conclusion it says that "should there be any change in present fares and charges, there should be reduction rather than increases." It recommends that the committee be continued and empowered to take steps to prevent any increases.

Skip Stop in Preparation at Charleston, S. C.—Preliminary to inaugurating the skip stop on all its lines, the Charleston Consolidated Railway & Lighting Company, Charleston, S. C., has painted its poles with broad white bands. These poles are spaced as recommended by the Fuel Administration—eight to the mile in the city and six in the suburbs. This means that the suburban practice is practically unchanged, while city stops are cut two or more to the mile. During the winter the company met the request to save fuel by curtailing service, six, eight, nine and ten-minute headways being increased to twelve. This meant five single-truck cars less in city service. The curtailment, however, probably cost the company more than it saved owing to the rapid increase of the riding population in consequence of war activities.

Personal Mention

A. J. Davies has been appointed general superintendent of the Kansas City-Western Railway, Kansas City, Kan., succeeding J. G. Herrin, who resigned recently. Mr. Herrin had been with the company twenty-five years. He is in ill health.

I. G. Walborn has resigned as electrical engineer of the Eastern Pennsylvania Railways, Pottsville, Pa., to go into the business of scientific farming on a large scale in partnership with his father at Orwigsburg, the ancient county seat of Schuylkill, now the center of a large agricultural district.

F. L. Butler has assumed the position of general superintendent of the Winnipeg (Man.) Electric Railway, succeeding Wilson Phillips, who remains with the company in an advisory capacity. Prior to going to Winnipeg Mr. Butler was general manager of the Chicago & West Towns Railway and the Suburban Railroad, Chicago.

F. W. Arthur has resigned from the Westinghouse Electric & Manufacturing Company, to become superintendent of sales of the Northern Ohio Traction & Light Company at Akron, Ohio. Mr. Arthur has been connected with the Westinghouse Company for seven years in the railway and power department of the Cincinnati office.

George A. Mills has been appointed electrical engineer of the Winnipeg (Man.) Electric Railway. For six years Mr. Mills has been electrical engineer for the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, and while in this capacity installed a system designed to take care of electrolysis. Prior to this he was electrical engineering instructor at the University of Pennsylvania.

Ralph W. E. Donges, president of the Board of Public Utility Commissioners of New Jersey, has been commissioned a lieutenant-colonel in the National Army. Governor Edge of New Jersey has requested Secretary of War Baker to permit the continuance of Mr. Donges' commissionership until pending important rate cases are decided. Lieutenant-Colonel Donges has been a commissioned officer in the New Jersey National Guard for the last seventeen years. He has been a member of the State board since 1913, when he was appointed by Woodrow Wilson, then Governor.

George W. Schmidt has been appointed chief engineer of the Northern Ohio Traction & Light Company's power plant at Akron. Mr. Schmidt began his career in the electrical industry in the mechanical department of the Union Electric Light & Power Company, St. Louis, where he remained for eight years. He was then appointed chief engineer of the power station of the company and served in that capacity for five and one-half years. Mr. Schmidt resigned from the company in St. Louis on March 1 to become connected with the Northern Ohio Traction & Light Company.

J. E. Hester, formerly general foreman of the car building, repair and painting department of the Union Traction Company of Indiana, Anderson, Ind., has been advanced to the position of acting master mechanic, succeeding M. F. Skouden, who has been appointed acting superintendent of motive power of the company. Mr. Hester entered electric railway work on Sept. 26, 1900, with the Union Traction Company in the carpenter repair department and has been in the service of the company continuously since that time except for two and one-half years he was with the Winona Interurban Railway at Winona Lake, Ind., in charge of the shop at Winona Lake. For the last six years Mr. Hester has been in charge of the woodworking and painting department of the Union Traction Company as general foreman.

W. C. Stockman, who has been acting superintendent of transportation of the Mobile Light & Railroad Company, Mobile, Ala., has been designated as permanent superintendent of transportation of the company. In this position he succeeds W. J. Sherwood, who resigned more than a year ago to become connected with the Motor Bus Company, Chicago, Ill. Mr. Stockman entered railroad work with the Louisville & Nashville Railroad. He went to work for the Mobile Street Railroad in 1892, while that line was still operated with horses, and remained with the company as conductor and later as motorman until 1901, when the Mobile Street Railroad was consolidated with the Mobile Light & Railroad Company. In 1902 Mr. Stockman was appointed inspector for the Mobile Light & Railroad Company, and in 1907 he was made chief inspector, which position he has held until the present time.

Obituary

Allan H. Royce, vice-president of the Toronto (Ont.) Suburban Railway, is dead. Mr. Royce was a member of the firm of Royce, Henderson & Boyd, barristers, Toronto, and was solicitor for the Toronto Suburban Railway for many years. He was elected secretary-treasurer of the Canadian Street Railway Association at the organization meeting in 1904 and retained the position until July 31, 1907.

Construction News

Construction News Notes are classified under each heading alphabetically by States.
An asterick (*) indicates a project not previously reported.

Recent Incorporation

*Emergency Transportation Company, Oakland, Cal.—Application for a charter has been made by the Emergency Transportation Company to operate street railways either with electricity or any other power, in Oakland, Alameda, Berkeley, Emeryville, San Leandro and Hayward. The incorporators are the following officers of the San Francisco-Oakland Terminal Railways: W. R. Alberger, vice-president and general manager; F. W. Frost, secretary and treasurer; B. W. Fernald, auditor; George H. Harris, general superintendent, and W. H. Smith, attorney.

*Colonial Traction Corporation, Williamsburg, Va.—Incorporated to construct a line from Williamsburg to Yorktown, Newport News, etc., about 50 miles. Capital stock, $25,000. Officers: William S. Gribble, president, and Lawrence P. Gribble, secretary, both of Williamsburg.

Franchises

East St. Louis, Ill.—The East St. Louis & Suburban Railway has received a franchise from the City Council of East St. Louis to construct a line on Twentieth Street between Ridge Avenue and Henrietta Avenue.

Baltimore, Md.—The United Railways & Electric Company has received a franchise from the Anne Arundel County Commissioners to extend its Curtis Bay line through Fairfield and the surrounding community as far as Wagner's Point. Some of the county roads will be widened as part of the agreement.

Toronto, Ont.—The Toronto, Niagara & Western Railway, which proposes to construct an electric line between Toronto and the Canadian-Niagara frontier, via Hamilton, with a branch line along the Canadian shore of Lake Erie between Port Colborne and St. Catherines, Ont., has made application to the railway committee of the city of St. Catherines for permission to extend the time within which to begin construction. Abnormal cost of all railway construction supplies, shortage of labor due to the war, etc., are given as causes for the delay. The municipality has reported favorably on the application and the time has been extended but the date has not been fixed. [Jan. 22, '16.]

Chester, Pa.—The City Council of Chester at a special meeting recently called by Mayor McDowell, granted the Philadelphia Rapid Transit Company permission to make the changes asked for in its ordinance to facilitate the transportation of workmen to the munition and shipyard plants in Chester and Eddystone. The ordinance was passed as a war measure and will remain effective during the war and two years after peace is declared. The changes provide for double tracks for a distance in Fourth Street, single tracks in Fourth Street from Morton Avenue to Crosby Street, and in Crosby Street to Third Street, and a double curve at Third and Crosby Streets. The changes are in compliance with a letter received by the Mayor from A. Merritt Taylor, manager of transportation for the Emergency Fleet Corporation.

Charleston, S. C.—The City Council of Charleston has granted the Charleston & Summerville Interurban Railway, which proposes to construct a line between Charleston and Summerville, about 22 miles, a one year's extension of time on its franchise in which to make the necessary arrangements to begin construction. J. L. David, Charleston, president. [Nov. 4, '16.]

Track and Roadway

Alabama Interurban Corporation, Birmingham, Ala.—Work will be begun by the Alabama Interurban Corporation within the next sixty days on its proposed line from Birmingham to the Warrior River. The City Council of Bessemer recently granted the company a franchise over some of the principal streets, and at that time 90 per cent of the right-of-way and terminals at Warrior River had been secured. Thomas L. Cannon, Birmingham, president. [April 13, '18.]

Calgary (Alta.) Municipal Railway.—It is reported that the Calgary Municipal Railway has awarded a contract to the Birnie Lumber Company for the supply of 10,000 ties for replacement.

United Railroads of San Francisco, San Francisco, Cal.—The Railroad Commission of the State of California has granted permission to the United Railroads of San Francisco to use $170,900 of the moneys deposited in its depreciation fund to pay for the construction of the Army Street line and other improvements.

Pensacola (Fla.) Electric Company.—The Pensacola Electric Company has made application to the War Finance Board for financial assistance in extensive improvements which the company is planning relating to the Bayshore line, additions to the power plant and the purchase of new equipment in order to meet the needs of the army and navy and shipbuilding plants.

Detroit (Mich.) United Railway.—Active work was resumed recently by the Detroit United Railway on the construction of a double-track line on Linwood Avenue from Ferry Park Avenue to Joy Road. It is expected that the line will be ready for operation this summer.

Kansas City (Mo.) Railways.—The directors of the Kansas City Railways have approved the construction of a double-track extension from Prospect Avenue west to Troost Avenue, with provision for a single track on Twenty-seventh Street from Troost Avenue west to Main Street. This single track would be used in conjunction with a single track already laid on Twenty-fifth Street. Owing to war conditions, the times for building the line was left indefinite.

Public Service Railway, Newark, N. J.—The Board of Public Utility Commissioners has issued an order directing the Public Service Railway to make various repairs to property and equipment on the Union line and the Newark and Elizabeth line and directed that the service be otherwise improved. The board gave the company until Sept. 1 to make certain specified repairs to its tracks in North Broad Street, Broad Street, East Grand Street, Smith and East Jersey Street.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—Improvements have been begun by the Trenton & Mercer County Traction Corporation on its lines in the West State Street section, as well as on the Princeton, Lawrenceville, Pennington, Hopewell and Yardville divisions.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District has under consideration the awarding of a contract to the Bethlehem Steel Bridge Corporation, the lowest bidder, for furnishing and erecting the steel for Section 3 of Route 49, being that portion of the Culver Rapid Transit Railroad between Avenue X and Coney Island. The commission on May 21 will receive bids for the construction of column foundations in connection with the above contract. The commission has awarded to Holbrook, Cabot & Rollins and G. W. McNulty, jointly, the lowest bidders, at $600,134, the contract for the installation of tracks on the Flatbush Avenue and Eastern Parkway subway line in Brooklyn, on the Nostrand Avenue branch of the same line and also on the Brighton Beach connection in Flatbush Avenue and St. Felix Street. The commission is also advertising for the receipt of bids for a supply of broken stone to be used as ballast on new rapid transit lines. This bid, will be received at the commission's new offices, 49 Lafayette Street, on May 21.

Corning & Painted Post Street Railway, Corning, N. Y.—An extension will

be built by the Corning & Painted Post Street Railway to North Corning, provided the city will amend the franchise granted the company so as to permit the building and maintenance of the line on the same basis that the company built and now maintains and operates its main line, and providing the city will permit express packages and freight to be carried in and out of the city on trolley cars.

New York & Queens County Railway, New York, N. Y.—The Public Service Commission for the First District of New York approving an opinion by Commissioner Charles Buckley Hubbell, has issued an order permitting the New York & Queens County Railway to suspend for two years longer, from July 29, 1917, to July 29, 1919, the operation of cars across the Flushing Meadows between Summit Avenue and Jackson Avenue during the period required for filling in the meadows and changing the grade thereof. The commission granted a similar application on July 29, 1915, for a period of two years. Inasmuch as the filling in of the meadows was not completed within the two years specified in the previous order, an extension has been granted.

Tidewater Power Company, Wilmington, N. C.—Construction has been begun by the Tidewater Power Company on an extension about 1 mile long to the new shipyard plant.

Sapulpa (Okla.) Electric Interurban Company.—The Corporation Commission of Oklahoma has sustained the contention of the Sapulpa Electric Interurban Company of its right to take up 1 mile of its track in the city of Sapulpa to provide steel for an extension from Sapulpa to Tulsa. The company, finding it difficult to get new steel for the construction of the Tulsa line, some time ago started to take up a mile of its track, but was asked to delay until the matter could be considered by the Corporation Commission. The company maintained that a better purpose could be served by the steel in the Tulsa-Sapulpa interurban, than for local traffic, and the commission sustained this contention.

Brantford (Ont.) Municipal Railway.—The construction of an extension to the Terrace Hill district is being contemplated by the Brantford Municipal Railway.

Grand River Railway, Galt, Ont.—It is reported that the tracks of the Grand River Railway along the river in Hespeler will be relocated. Surveys are said to have been completed which will do away with a number of curves and give a practically straight route.

Nipissing Central Railway, North Cobalt, Ont.—Application has been made by the Nipissing Central Railway to the Dominion Parliament for a five-years' extension of time within which it may build a line from Latchford, Ont., to the Grand Trunk Pacific Railway near the Matagami River, Que.; from Latchford along the Montreal River, to the Grand Trunk Pacific Railway in Ontario; from Latchford southerly to Timagami station; an extension of the present line from Liskeard westerly to meet the last mentioned line; a line from Liskeard to Charlton; a line from the first mentioned line, starting at Wendego Lake, westerly to the Temiskaming & Northern Ontario Railway, and a branch line from the first mentioned line, starting in Casey Township to North Temiskaming, on the Des Quinze River.

Toronto, Ont.—A petition has been made to the Ontario Railway Board to suspend the order for the construction of the Pape Avenue extension by the Toronto Railway in order that the rails may be used in building the municipal line over the Bloor Street Viaduct, which is regarded as a more important work at the present time. The application was made jointly by Works Commissioner Harris and Assistant City Solicitor Fairty, acting for the city, and F. L. Hubbard acting for the Toronto Railway.

Cumberland Valley Railroad, Chambersburg, Pa.—Several trial trips have been made with a storage battery car on the lines of the Cumberland Valley Railroad between Mechanicsburg and Dillsburg.

Dallas (Tex.) Railway.—Work has been begun by the Dallas Railway on the construction of a line on Second Avenue. After the tracks have been laid on Second Avenue those on Exposition Avenue will be removed and the terminals at the entrance to Fair Park will be rearranged. When the Second Avenue line is opened for operation it will be combined with the present North Loop line, forming a crosstown service from the city limits on Second Avenue to Jefferson Avenue and Tyler Street in Oak Cliff. With the removal of the tracks on Exposition Avenue, Gaston Park will be made part of Fair Park, and the added property will be used for quartering the cadets and officers at Camp Dick during the State Fair next fall.

Tacoma, Wash.—It is reported that the construction of an electric railway between Tacoma and Camp Lewis is being contemplated. Jay W. McCune, Traffic and Transportation Bureau, may give information.

Shops and Buildings

Pacific Electric Railway, Los Angeles, Cal.—Work will be begun at once by the Pacific Electric Railway on the construction of a new station at San Pedro.

Lehigh Valley Transit Company, Allentown, Pa.—A contract has recently been awarded by the Lehigh Valley Transit Company to Robert S. Rathbun, Bethlehem, for the construction of a new one-story freight house, about 60 ft. x 75 ft., to be located in the South Side section of Bethlehem. It is estimated that the proposed new structure will cost about $10,000.

Power Houses and Substations

Pacific Electric Railway, Los Angeles, Cal.—A contract has recently been awarded by the Pacific Electric Railway to Houghton & Anderson, Los Angeles, for the construction of a brick substation, about 35 ft. x 45 ft., to be located in the Wilmington district.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—The Levy Court of Wilmington has granted the Wilmington & Philadelphia Traction Company, perpetual permission to erect and maintain poles and wires for electric light and power in New Castle. John F. Neary, attorney for the company, stated that the purpose is to maintain a high-tension line from the electric plant in the city to the Baldt steel plant at New Castle. He said the Wilmington City Electric Company had the authority, but did not have the necessary funds, and the Wilmington & Philadelphia Traction Company would provide the funds.

United Light & Railways Company, Grand Rapids, Mich.—Work is under way on the installation of a 22,500-kw. turbine at the Moline, Ill., power house of the United Light & Railways Company.

Manchester Traction, Light & Power Company, Manchester, N. H.—The Manchester Traction, Light & Power Company has completed its dam on the Piscataquog River at Gregg's Falls. Two generators of 1500 kw. each will be installed in the new power station. Electricity will be transmitted at 33,000 volts to the Kelley's Falls station. The main generating room of the power station, not yet completed, will be 85 ft. by 40 ft.; the transformer room will be 25 ft. by 74 ft., and will be equipped with three transformers, each having a rating of 1250 kva. A permit has been granted to the Manchester Traction, Light & Power Company for the purpose of erecting a boiler house near Mast Street.

Interborough Rapid Transit Company, New York, N. Y.—A new one-story transformer station is being built by the Interborough Rapid Transit Company at 154 West Sixteenth Street, to cost about $40,000.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—An addition will be built by the Puget Sound Traction, Light & Power Company to its power house at Fourteenth Street, South, to cost about $30,000.

Washington Water Power Company, Spokane, Wash.—Application has been filed by the Washington Water Power Company for permission to construct a reservoir and store unappropriated waters of the Baker River, to the amount of 30,000 acre-feet, to be used for power development. The cost of the proposed project is estimated at about $1,000,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Increasing Cost of Railway Operation and Equipment

Review of the Market from a Southeastern Standpoint—Advances in Cost of Material

Although the price of a few basic metals has dropped off slightly the general tendency is upwards, covering all commodities used in electric railway operation in the Southeast, as well as other sections of the country. Operating ratios are increasing with the continued and growing high price levels on materials, and the margins of net incomes are lessening each day, especially where no relief has been forthcoming through increased fares. Sheet brass, copper wire, aluminum and quicksilver prices for 1917 showed a decline over 1916, and 1918 quotations are holding close to the high marks of the past year. It is expected that the ever-soaring enhancement of cotton fabrics will be reflected in an expansion of insulated wire prices. Lightning arresters are up about 50 per cent over pre-war figures, a slight increase being recorded in the last six months. Hangers, ears, rail bonds and trolley wheels show little change for the last six months, closely following the basic metal market.

While air-brake equipment is up 75 to 100 per cent over normal, there has been no perceptible change lately to record. What can be said regarding air brakes holds true as well for motors, controllers and car cable. Very little second-hand apparatus is offered, but even transactions in this line are bringing unheard of figures. Quotations on rotaries remain firm, and no material variation has been observed since the 1916 advance, which was 40 to 50 per cent above normal. Transformers and associated equipment have enhanced somewhere in the neighborhood of 20 per cent in the last twelve months, and rumors are afloat that this class of apparatus is due for a further increase shortly. Since the war transformers have advanced 75 per cent and as much as 100 per cent in isolated cases. With regard to price changes armature coils can be put in the same class as transformers, with the exception that they have advanced only 10 per cent in the last year. Iron wire is up 33 per cent over early 1917 quotations.

A comparison of 1918 quotations with those of early 1917 indicates an average increase of 53 per cent on the following metals: foundry pig iron, sheet and steel bars, steel plates and shapes, spikes, cold-rolled shafting, rivets, common and refined bar iron, galvanized and black sheets and nails. It appears that the limit has not been reached in the prices of axles and forgings, even though they have advanced more than 300 per cent over pre-war quotations. Car wheels are comparatively steady. Cross ties, chestnut and pine poles continue to advance.

Pneumatic Door Control Growing in Favor

Adopted by Leading Railways—Ease of Operation for Women Conductors —Use on One-Man Cars

With the advent of women in ever-increasing numbers as conductors on electric cars, devices that contribute to ease of operation of cars are finding a wider market and readier sale. An illustration of this is furnished by air door engines, as they are described by one manufacturer; and pneumatic door and step control by another. Both of these mechanical improvements have been illustrated and given detailed treatment in the ELECTRIC RAILWAY JOURNAL. The engines or controls save in energy consumption, because stops are shortened through faster opening and closing of doors. Where women are employed on one-man cars the closing or opening of heavy car doors and the dropping or raising of weighty steps by mechanical means is being seriously considered.

Because one important Eastern road had placed 250 pneumatic engines on its subway cars, the employment of women guards has proved easy. The same company also has 100 surface cars so equipped and operated largely by women conductors. Simply by touching a push button the door engine, which can be adjusted for any speed of travel desired, is operated without the slightest physical effort. As further proof of their utility and popularity, these door controls or engines are being introduced on the leading traction systems all over the country.

In Washington, D. C., the new cars ordered are so equipped, and much of the old rolling stock is being rebuilt for the installation of the door control devices. Kansas City and companies in the South have recognized their worth and convenience and have placed orders for early delivery. And furthermore, the manufacturers declare shipments are ready whenever the car builders want them.

During a year there has been an advance in price of about 35 per cent due to natural conditions, but no further increase is anticipated unless scarcity of labor should impose conditions not now considered in the reckoning.

Supply of Wood Handles for Tools Short

Curtailment of Production With Government Requirements Causing Sharp Advances

A shortage of wood handles for railway picks, shovels, hammers, sledges, axes, hatchets and all kinds of tools in this line is very acute, and manufacturers and jobbers are unable to get adequate stocks. The government is in the market for all the available hickory timber, for use in aeroplane and other construction, and also for larger quantities of ash timber, such as used in making handles for tools and implements. Some manufacturers of picks, shovels and handle tools are said to be held back in production because of their inability to get wood handles.

Stocks are in a very broken condition. At the same time the heavy operating expense has compelled many small handle factories to suspend operations. The heavy snows of last winter prevented the handle concerns from getting out the usual supply of timber and from hauling much that was cut. The government is also buying heavily of shovels and spades, which is further restricting the supply for commercial use. It is doubtful if the situation will show any improvement this summer.

PRICE SITUATION

Prices are continually advancing. Pick, shovel, hammer and other hardwood tool handles are up again, while the shortage of mill shipments still continues. No particular item is affected, but all seem to be in about the same condition. A distributor handling a heavy business said he would be compelled to place an order for shovels at once, in view of the handle situation, if he wanted delivery by Oct. 15. Permits for carload shipments of different tool handles are given gingerly, and often after they are awarded the goods must be made.

The appended are jobbers' prices on hardwood handles: A. E. hammer handles, at $1 per dozen; black hammer handles, 16-in., $1 per dozen; 18-in., $1.15 per dozen; machine hammer handles—14-in., $1 per dozen; 18-in., $1.25 per dozen; machine handles—14-in., 60 cents per dozen; 16-in., 65 cents per dozen; sledge handles—$3 per dozen; 36-in., $3.50 per dozen; extra 30-in. sledge handles, $1.80 per dozen; extra railroad pick handles, $3.25 per dozen; No. 1, $2.60 per dozen; No. 2, $2 per dozen; D handle, shovel, are 35 per cent from standard list.

Traction Railway Credits Not Impaired

Manufacturers and Supply Firms Report No Weakness Evident and Settlements Fairly Prompt

No impairment of credit standing is reported in connection with the accounts of the traction railway companies. It was surmised that possibly a softening of conditions, due to reduced incomes, would have an effect in the buying capacity and credit rating of the electric roads. Diligent inquiry among the credit departments of leading manufacturers and sales agencies of equipment and accessories failed to reveal other than a very satisfactory state of affairs in the Eastern district.

Rail mills, which carry large accounts for traction properties, declare there is no change in the standardization of credits. No extra time is asked, nor are more notes negotiated by buyers. There is no great activity in rolling steel for rails, and none for stock accumulation. The market is therefore firm and comparatively short. Prices are f.o.b. mill at time of shipment and at the convenience of the shipper. Terms are 2 per cent ten days, but from twenty-five to thirty days are sometimes taken, with no objection on the part of the seller.

Where a miscellaneous account is in question settlements are made in thirty days, but occasionally the time is stretched to sixty and ninety days. A great many bills are cleared through the supply houses, but no complaints of delinquency are mentioned, other than that some companies, which are perfectly sound and safe, are naturally slow pay. It is their habit, though none of the credit men are inclined to have it emulated. Again, where thirty to sixty days is the rule, some debtors are letting it run to ninety and 120 days. These, however, are exceptions. It is generally admitted that the delays in the delivery of goods are responsible in a great many instances for slow or dilatory settlements. As was distinctly stated, no one could reasonably expect a buyer to pay for merchandise until it is received with the additional thirty days allowable from date of delivery for a chance to realize.

Firm Market on Railway Hardware

Orders Are Subject to Mill Acceptance and Shipping Convenience—Plants Are Running to Capacity

Electric railway shops, accustomed to buying material in suitable quantities for reserve stock, are inclined to purchase in a hand-to-mouth way now, according to sales managers of supply houses as well as manufacturers. Spikes, tie plates, tie rods, fish and angle plates, angle bars, rail bolts and nuts, with few exceptions, are quoted on the government price base, f.o.b. mill, orders subject to mill acceptance and shipment at its convenience. The usual practice, in order to obtain a favorable price, is to buy spikes in car lots, though quantities less than 200 kegs, with an advance of $1 a hundredweight, are by no means unknown. The market quotations are customarily made by the pound, minimum quantities named when specifications are supplied. Prices practically are stationary, with no recent change.

Manufacturers of nuts and bolts, as well as tie and fish plates, tie rods, angle plates and bars are now running their mills to full capacity and are turning over 100 per cent of their output to the government. This will likely last for sixty days or more, and, in the meantime, commercial consumers will have to get along as best they can. The general demand for some months has been very quiet, with stocks held by jobbers and dealers low. The government figures will be effective until June 30.

With railways always carrying sufficient supplies for current needs, the jobber and even the retailer is occasionally called upon for an emergency order. As a rule, however, jobbers do not find it profitable to carry much of a stock of the above-mentioned items. Traction roads for quite a period have wanted to buy as close as possible by going direct to the manufacturer. To this practice jobbing houses have raised no objection and consequently they are secondary factors in the business.

Deliveries range from two to three, six and eight months. One prominent house, which termed the present a seller's market, said on certain articles he would be obliged to place an order now so as to insure October delivery. The shipment is doubtful.

Rolling Stock

Lehigh Valley Transit Company, Allentown, Pa., has asked for specifications and prices on four new cars of the interurban type.

Nipissing Central Railway, North Cobalt, Ont., Canada, is contemplating buying two car bodies.

McComb & Magnolia Light & Railway Company, McComb, Miss., will purchase two passenger cars in the near future.

Hull Electric Company, Hull, Que., Canada, has ordered one double-truck steel sweeper, 46 ft. long over all, equipped with brooms and plows for double-end operation, from the Ottawa Car Manufacturing Company.

Galt River Railway, Galt, Ont., Can., had an oil stove explosion in one of its electric locomotives while in the yards of the Canadian Pacific Railroad at Galt, practically destroying it. The locomotive will be rebuilt.

Shore Line Electric Railway, Norwich, Conn., in conjunction with the Worcester (Mass.) Consolidated Street Railway, is reported as about to construct six trailers. They are to be operated between Worcester and New London, Conn.

Charleston Consolidated Railway & Lighting Company, Charleston, S. C., has placed a contract with the Cincinnati Car Company for sixteen double-truck cars, six with motors and ten to be trailers. Also ten smaller cars of thirty-five-passenger capacity.

Manila Electric Railroad & Light Corporation, Manila, P. I., mentioned in the ELECTRIC RAILWAY JOURNAL of May 4 as contemplating the purchase of fifteen new cars, will have them built in their own shops in Manila. The motors and other equipment will be purchased in the United States. The last cars built for the Manila property, controlled by the J. G. White Management Corporation of New York, were built by the J. G. Brill Company.

Boston (Mass.) Elevated Railway is asking for bids on 300 new cars, 200 motor cars of the general design of which are to be center-entrance, the latest units of this type in service on the road; and 100 of which are to be center-entrance trail cars, also of standard type for Boston operation. Specifications have been completed for bodies and will probably be ready soon for motors and electrical equipment. New trucks and air-brake with accessory apparatus, will be required for this rolling stock.

New York State Railways (Syracuse Lines), Syracuse, N. Y., having ordered twenty-five new cars from the J. G. Brill Company, furnishes the following specifications:

Number of cars ordered	25
Name of road	New York State Railways, Syracuse Lines
Builder of car body	J. G. Brill Co.
Type of car	Front-entrance, center-exit
Seating capacity	52
Weight (total)	35,000 lb.
Bolster centers, length	25 ft. 0 in.
Length over bumpers	47 ft. 7 in.
Length over vestibule	46 ft. 7 in.
Width over all	8 ft. 2 in.
Height, rail to trolley base	10 ft. 9½ in.
Body	Semi-steel
Interior trim	Natural cherry
Headlining	Agasote
Roof	arch
Air brakes	Westinghouse
Axles	Laclede Steel Co.
Bumpers	Brill
Car trimmings	Bronze
Conduits and junction boxes	Condulets
Control, type	Westinghouse H. L. D.
Couplers	Tomlinson Car & Air
Designation signs	Hunter
Door operating mechanism	National Pneumatic Co.
Fare boxes	Johnson
Fenders or wheelguards	Eclipse
Gears and pinions	Tool Steel
Hand brakes	National Brake Co.
Heaters	Peter Smith forced ventilation
Headlights	Crouse-Hinds
Journal boxes	Brill
Lightning arresters	Westinghouse
Motors	Four Westinghouse 506A, inside hung
Paint, varnish or enamel	F. & C. Simplex system
Registers	International R-10
Sanders	Ohio Brass Air
Sash fixtures	Brill
Seats, style	Hale & Kilburn
Seating material	Cane
Step treads	Feralun
Trolley catchers or retrievers	Earll retrievers
Trolley base	Ohio Brass Co.
Trolley wheels or shoes	Star Brass Works
Trucks, type	Brill No. 67 F
Ventilators	Automatic Ventilator Co.
Wheels (type and size)	26-in cast iron

Trade Notes

Larkin G. Mead, successor to Curran & Mead, New York, will remove his offices on June 1, 1918, from 55 Park Row to 110 West Fortieth Street.

The Electric Service Supplies Company has secured larger quarters in the Hudson Terminal Building, 50 Church Street, New York, N. Y., and is now occupying rooms 1771 and 1773.

Smith-Ward Brake Company, Brooklyn, N. Y., asks this paper to say that Herbert M. Weaver left its employ in August, 1915, and is not in any way connected with the company.

The Consolidated Car Heating Company has changed its offices in the Singer Building, New York City, from 2609 and 2610 to 1814 and 1815, where better quarters are secured.

C. F. Gailor, president and director of the Atlantic Welding Company, New York, since its incorporation in June, 1917, has resigned to accept a commission in the government service and will report in Washington immediately.

Brooklyn (N. Y.) Rapid Transit Company calls attention to the note appearing in the ELECTRIC RAILWAY JOURNAL of April 27 regarding an order for ventilators in connection with its recent purchase of fifty new center-entrance trail cars. The company says that it does not intend to use any type of automatic ventilators on these cars.

Bound Brook (N. J.) Oil-Less Bearing Company announce that after May 15, 1918, its Western office will be located at room 1723 Ford Building, Detroit, Mich. They were formerly located at 308 Moffat Building. This office is in charge of Harry J. Lindsley, Western sales manager.

Economy Electric Devices Company, Chicago, reports that it has received an order from the Galesburg & Kewanee Electric Railway, Kewanee, Ill., for Sangamo economy watt-hour meters for all of its cars. The Dubuque (Ia.) Electric Company has also ordered the economy meters for all of its active cars as the result of a service test.

D. C. & William B. Jackson, engineers, Boston and Chicago, announced that on account of two members of the firm having gone into the national service, and the third member expecting to do so as soon as practicable, they will close their offices and suspend business for the duration of the war as soon as the various pieces of work with which they are now occupied can be completed. They expect to resume business after the conclusion of the war.

E. E. Maher has been appointed by the Terry Steam Turbine Company, Hartford, Conn., manager for the Chicago district, with offices at 1328-29 McCormick Building, 322 South Michigan Avenue. John D. Stout has become manager of the New York office of the Terry company in charge of that district, with the exception of navy and marine installations which will now be handled by Mr. Herbert. Mr. Stout will now devote his entire time to navy and marine requirements.

New Advertising Literature

Buffalo Forge Company, Buffalo, N. Y.: An illustrated catalog describing the company's portable forges.

General Electric Company, Schenectady, N. Y.: Indexes to descriptive bulletins and sheets and also index of supply part bulletins.

Boone Scrymser Company, New York, N. Y.: Turbo machine oil as advertised in a circular being distributed by the company.

Link-Belt Company, Philadelphia, Pa.: Book No. 312 describing the Link-Belt silent chain drive for operating machine tools. The bulletin is profusely illustrated.

Mitchell-Rand Manufacturing Company, New York, N. Y.: One of the most comprehensive catalogs in this line recently distributed by the company entitled "Everything in Insulation." Not only are the many forms of insulation illustrated, but a detailed description is given of the treatment of the raw material, through the various process stages until the finished article is reached. Various tables of value to those interested in the meaning, purpose and application of these specialties are furnished, with carefully prepared chapters by an expert on insulating paints and varnishes, waxes and compounds. The cross-index gives additional value to this very complete publication, copies of which may be obtained free on application to the company.

NEW YORK METAL MARKET PRICES

	May 8	May 15
Copper, ingots, cents per lb.	23½	23½
Copper wire base, cents per lb.	26½ to 26¾	26½ to 26¾
Lead, cents per lb.	6.62½	6.90
Nickel, cents per lb.	50	50
Spelter, cents per lb.	7.32½	7.37½
Tin, Straits, cents per lb.	$1.00	$1.05
Aluminum, 98 to 99 per cent., cents per lb.	†32.10	†32.10

† Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	May 8	May 15
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19½	19½
Red brass, cents per lb.	18	18
Yellow brass, cents per lb.	13	13
Lead, heavy, cents per lb.	6¼	6
Zinc, cents per lb.	5½	5½
Steel car axles, Chicago, per net ton.	$41.52	$41.52
Old carwheels, Chicago, per gross ton.	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton.	*$34.00	*$34.00
Steel rails (relaying), Chicago, gross ton.	$60.00	$60.00
Machine shop turnings, Chicago, net ton.	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	May 8	May 15
Rubber-covered wire base, New York, cents per lb.	27 to 30	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	30.40 to 34¼	30.40 to 34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.35
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 500-ton lots, per gross ton	.....	$60.00
T-rails, high (Shanghai), cents per lb.	4¼	4¼
Rails, girder (grooved), cents per lb.	4¾	4¾
Wire nails, Pittsburgh, cents per lb.	3¾	3¾
Railroad spikes, drive, Pittsburgh base, cents per lb.	4¼	4¼
Railroad spikes, screw, Pittsburgh base, cents per lb.	...	8
Tie plates (flat type), cents per lb.	*3¼	*3¼
Tie plates (brace type), cents per lb.	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb.	7	7
Fish plates, cents per lb.	*3¼	*3¼
Angle plates, cents per lb.	*3¼	*3¼
Angle bars, cents per lb.	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb.	4.90	4.90
Steel bars, Pittsburgh, cents per lb.	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb.	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb.	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb.	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount, F. O. B. factory	80% to 82-3%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount, F. O. B. factory	79%	80%
Car window glass (double strength, all sizes AA quality), New York, discount, F. O. B. factory	80%	82-3%
Waste, wool (according to grade), cents per lb.	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13½	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.00
Asphalt filler, per ton	$45.00	$45.00
Cement (truckload lots), New York, per bbl.	$2.65	$3.20
Cement (carload lots), Chicago, per bbl.	$2.71	$3.26
Cement (carload lots), Seattle, per bbl.	$3.05	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.60	$1.62
White lead (100 lb. keg), New York, cents per lb.	10	10
Turpentine (bbl. lots), New York, cents per gal.	44½	42½

* Government price.



In Baltimore

"Peacock Brakes Are Installed On Every Car That's Modern"

2300 of them!

That's exactly what a Baltimore equipment man said when asked on what cars were Peacock Brakes installed?

Think of what it means when a great railway like the United Railways and Electric Company of Baltimore adopts safety equipment like a brake as far back as 1903 and sticks to it year after year for a schedule speed of 9½ to 10 m.p.h. and up to 12 stops per mile!

That's precisely the history of the Peacock Brake in Baltimore.

Baltimore knows from long and broad experience that the Peacock is not only a safe brake, but a brake that

Minimizes Money-Wasting Turnbacks

You cannot go wrong on the braking question when you specify Peacock Brakes as consistently as Baltimore. Send us your car layout and main operating conditions and we will suggest the Peacock that will give you the best braking for the least money.


The Eccentric Drum

National Brake Company

Buffalo, N. Y.

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CONSULTING ENGINEER and TRACTION EXPERT

Appraisals, Rate Investigations, Interurban and Street Railways, Traffic Surveys, Financial Reports

8 EAST LONG ST., COLUMBUS, OHIO

You are a faithful subscriber and reader of the Electric Railway Journal. You know how useful it is to you. Why not give us the names of those of your electric railway friends who would also benefit by being subscribers to the Electric Railway Journal? We will be glad to send specimen copies to any names and addresses that you mention.

ELECTRIC RAILWAY JOURNAL

THE P. EDW. WISCH SERVICE

Suite 1710 Park Row Bldg., New York
DETECTIVES
Suite 715 Board of Trade Bldg., Boston

ELECTRICAL TESTING LABORATORIES
Electrical, Photometrical and Mechanical Testing.
80th Street and East End Ave., New York, N. Y.

Scofield Engineering Co. Consulting Engineers
PHILADELPHIA, PA.

POWER STATIONS
HYDRAULIC DEVELOPMENTS
GAS WORKS
ELECTRIC RAILWAYS

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

AMERICAN BRIDGE COMPANY

HUDSON TERMINAL-30 CHURCH STREET, NEW YORK

Manufacturers of Steel Structures of all classes particularly BRIDGES AND BUILDINGS



Transmission Towers at Birmingham, Alabama. Alabama Power Company.

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DOSSERT CONNECTORS

Used in America's Win-the-War Industries

Look about you in the electric railway field and you will see DOSSERT connectors fulfilling their important duties faithfully and efficiently—just as they are doing in the industrial field from which the great supporting bases of America's armies abroad draw their very life blood.



Dossert Cable Tap

You will find Dossert Connectors in the establishments of the U. S. Engineers in France, in the plants of the Am. Inter. Ship Building Corp., the Submarine Boat Corp., the navy yards at Indian Head, Portsmouth and elsewhere; the arsenals at Watertown, Watervliet, etc.; the various Government embarkation piers and, as in the past, in hundreds of plants in the munitions, lumbering, coal, copper mining, transportation, central stations—and last, but not least, in the power houses of the leading electric railways.

Dossert & Company, New York
242 West 41st Street
H. B. LOGAN, President



NOW they use

DELTABESTON

Los Angeles Railway used to use asbestos cotton-covered magnet wire on one of its chief types of motors.

The cotton disintegrated through overheating, the field coil windings loosened and the asbestos covering broke down because of vibration in the coils. **Now they use DELTABESTON.**

Minimum motor maintenance has been attained and is kept with the aid of 12,000 lb. of No. 3 Deltabeston wire!

DELTATAPE permits the winding of a much better ribbon wound field coil than the old asbestos. The Deltatape treatment eliminates all short-circuits.

"D & W" FUSES positively will blow without noise or flame. ALL cars of the Interborough Rapid Transit Co., New York, use them exclusively.

At any place "D & W" products will cut motor maintenance costs and reduce the greater, though less tangible, item of lost car-hours due to breakdowns in service. Remember the big three—

"Deltabeston" — "Deltatape" — "D & W" Fuses

DELTABESTON WIRE

D & W FUSE CO.

PROVIDENCE, R. I.

D&W REG. U.S. PAT. OF

10 to 15 Thousand Miles On a Single Journal Box Packing



Eliminate the costly and troublesome hot box and get far greater mileage out of a single Journal Box packing, at a considerable saving of oil by using the

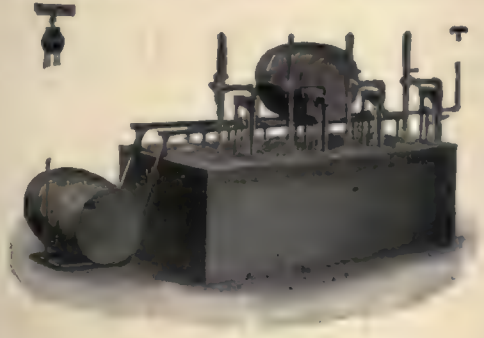
Milwaukee Waste Saturation System

This system saturates the waste **perfectly** and **thoroughly.** This assures constant lubrication of the bearings and reduces the Journal Box maintenance at least one-third.

Referring to the accompanying cut. The oil is kept in the lower compartment and the upper compartment is filled with waste. The oil is then drawn from the lower compartment, by means of the pump, and the waste is completely submerged in oil. It is left in this state for 18 or 24 hours. The handle (*B*) is then turned and the oil drains thru the screen (*D*) and back to the lower compartment thru the valve (*C*). After the waste has drained for about 24 hours it has reached a degree of perfect saturation which means 100% more mileage. The removable gauge stick (*A*) shows the quantity of oil in the lower compartment. The opening (*E*) is for cleaning or inspection.



Milwaukee Outfits Cut Your Oil and Labor Expense



We manufacture 30 different types of outfits for the economical storage and handling of such liquids as machine oils, cutting oils, kerosene, gasoline, etc. A Milwaukee Outfit will save you from 5 to 10 gallons of liquid on every barrel you use.

Write for our catalog of complete oil storage systems for Railways.

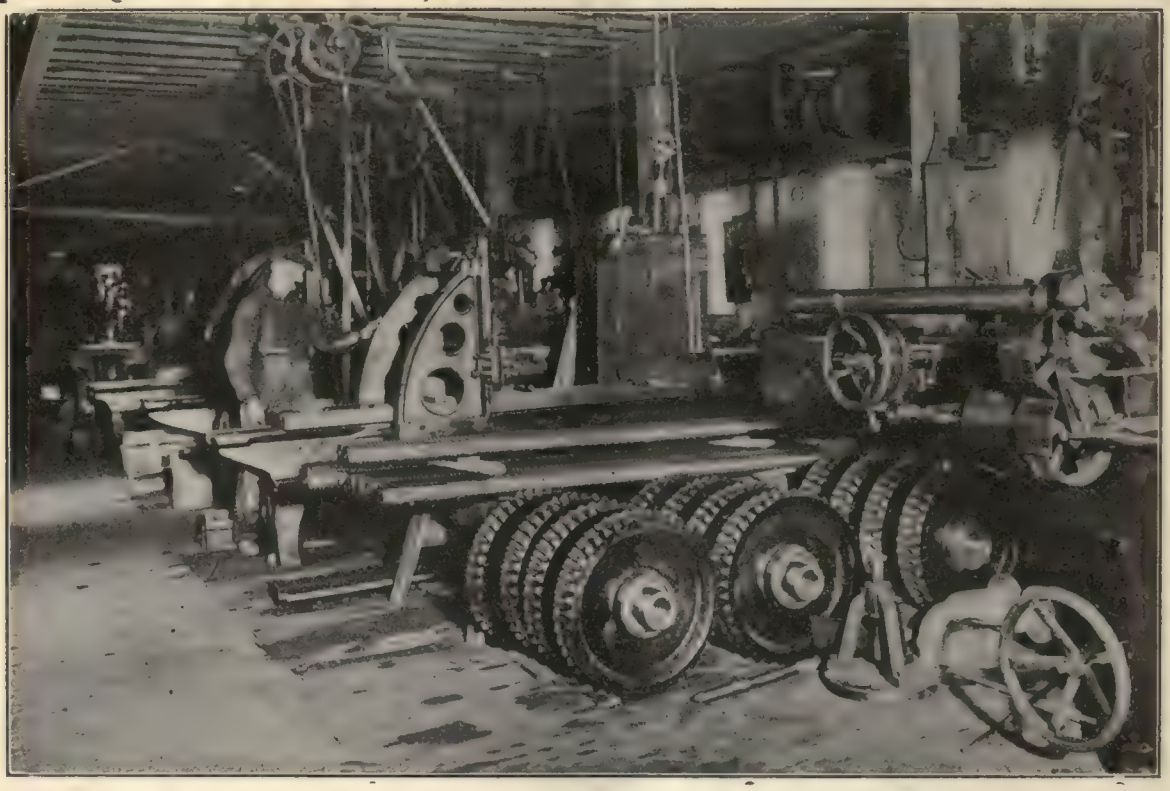
Milwaukee Tank Works, MILWAUKEE WISCONSIN

Manufacturers of oil storage outfits for Cleveland Railway Co., Chicago Elevated (all lines), Northern Ohio Traction and Light Co., Milwaukee Electric Railway and Light Co., and many others.



Columbia-Made Motor-Driven Car Hoists Save Shop Time and Man-Power





Parts of Columbia-made motor-driven car hoists with bevel-gear and worm transmission

Here's the famous Columbia-made motor-driven car hoist in the making!

We finish every part of the hoist ourselves, asking you only to furnish most any old traction motor to run it. This hoist is made

To raise cars of any length

To raise cars at 1 ft. per minute (ordinarily)

To raise cars without any swaying.

Columbia-made *wheel-changers* are also of worm and screw type. They lift 2000 lb. easily; can be made for hand or motor operation and with automatic cut-outs to prevent the motor-driven screw from running back.

Other Columbia-Made specialties are listed below.

Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St.

Brooklyn, N. Y.

W. R. Kerschner Co., Inc., N. Y.
Holden & White, Inc., Chicago
F. F. Bodler, San Francisco
Railway & Power Eng. Corp. Ltd., Toronto, Ont



TOOLS

Armature and Axle Straighteners
Armature shaft straighteners
Armature buggies and stands
Babbitting molds
Banding and heading machines
Car hoists
Car replacers
Coil Tapping machines for armature leads
Coil winding machines
Pinion pullers
Pit jacks
Signal or target switches
Tension stands

CAR EQUIPMENT

Armature and axle bearings
Armature and field coils
Bearings (axle and armature)
Brush-holders and brush-holder springs
Brake, door and other handles
Brake forgings, riggings, etc.
Car trimmings
Commutators
Controller handles
Forgings of all kinds
Gear cases (steel or malleable iron)
Grid resistors
Third-rail shoe beams and accessories
Trolley poles (steel) and wheels

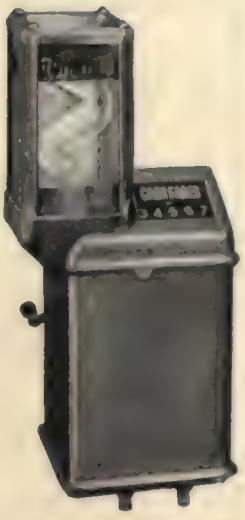


Ticket Side Type C17 Coin and Metal Ticket Fare Box

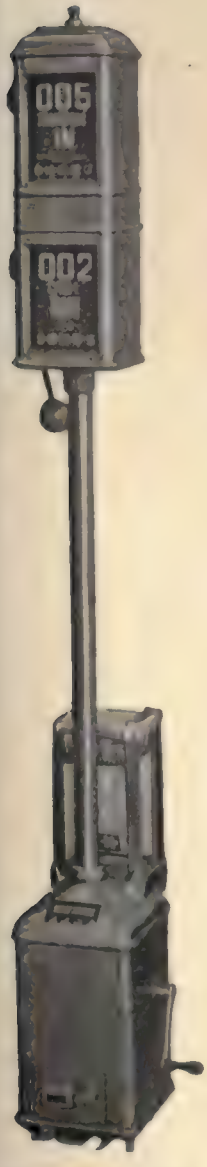
International Coin Registers

Permit Easier Employment of WOMEN

Through eliminating cords and rods



Cash Side Type C17 Coin and Metal Ticket Fare Box



Metal Ticket and Type C20 Coin, Transfer Register

It's getting harder and harder to get men conductors because Uncle Sam needs the big, sturdy fellows for war and munitions service.

That leaves you women and undersized men to pick from.

But the average woman is also short and cannot conveniently reach a bell cord or rod.

That won't worry you when you install International Coin Registers, the

Fare Box REGISTER in One

because every fare that goes into the box can be counted and registered merely by turning a handle or even through motor operation—

While the transfer and other paper can be registered very easily by means of a pull rope of any convenient length.



Motor-Driven Type C25 Coin and Transfer Register

The International Register Company

15 South Throop St., Chicago, Ill.

Position Open

For An Electric Railway Man Who Can Write Advertising Copy

This position is on the staff of the ELECTRIC RAILWAY JOURNAL —in the Advertising Service Department. It is a real "he" job.

Somewhere in the electric railway field there is a live wire who can fill it; a man who understands the problems of selling to the readers of the ELECTRIC RAILWAY JOURNAL, and who is on sufficiently intimate terms with the equipment used in his line to call things by their first name—a man who can *write*—a man with imagination, who perhaps finds his present position cramped.

The right man (and only one man is needed) will be brought to New York, placed in the Advertising Service Department and turned loose to make the fur fly. He will find himself in a big department, planted among a live aggregation of advertising copy writers and artists. Here he will have every chance to develop rapidly and to supervise the work of others. His job can be just as valuable as he makes it.

If you can meet requirements, and want to establish a permanent connection with a substantial publication and organization, the McGraw-Hill Company, Inc., wants you for this position.

Give full particulars in your letter. Kindly address:

Manager, Advertising Service Department
Electric Railway Journal
10th Ave., at 36th St., New York City



Collier Car Cards at Charlotte, N. C.

Charlotte may take just pride in her handsome cars kept spic and span as befits "The Queen City."

Not a small part of the interior attractiveness of these cars is due to the character of the car cards displayed.

They are Collier Cards. That means they are attractive, seasonable and readable cards.

Car cards that are read with pleasure produce the results that maintain the value of the street car as an advertising medium.

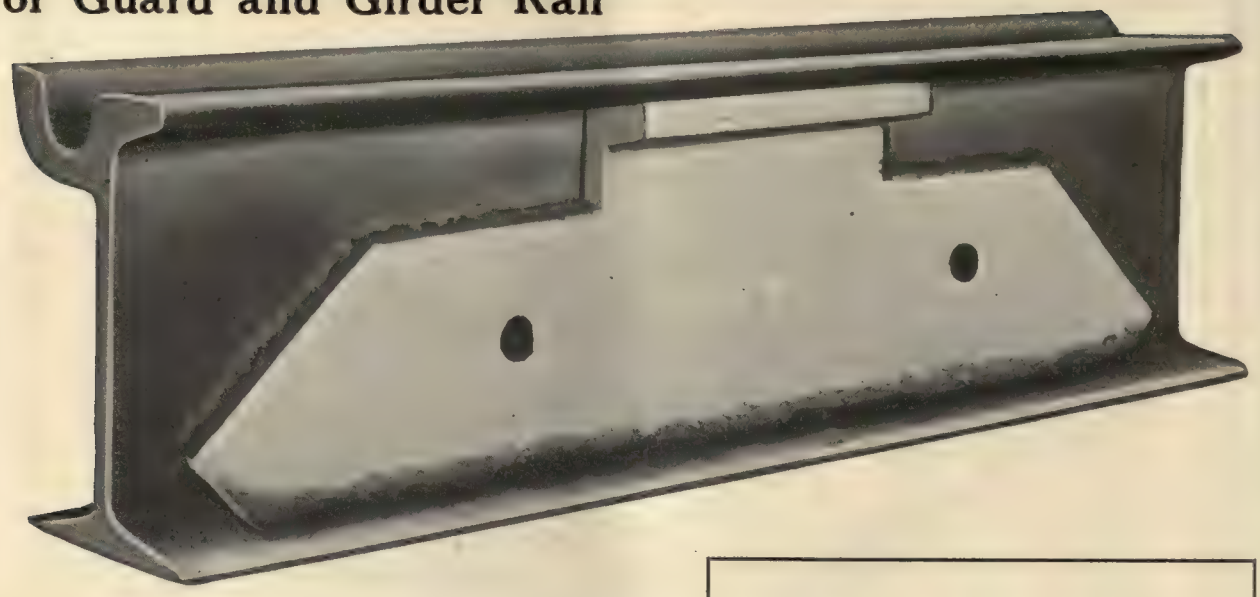
Cards of that kind can be produced only by a nation-wide organization, to wit, Collier Service.

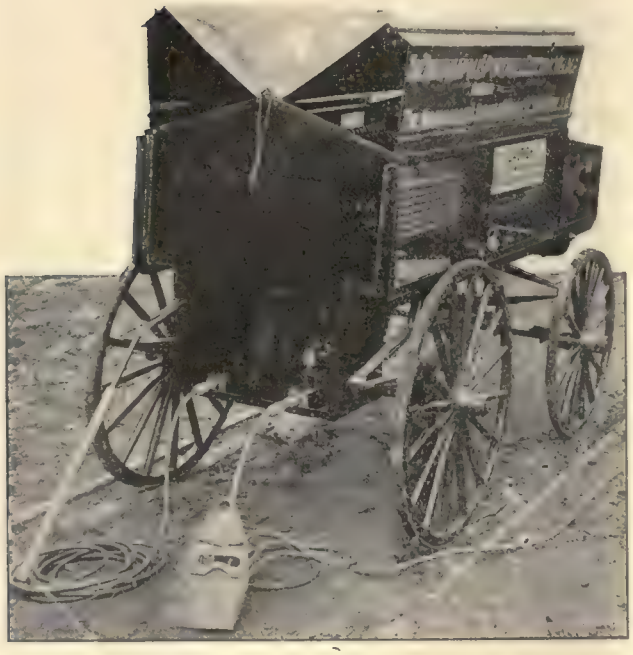
Barron G. Collier INCORPORATED

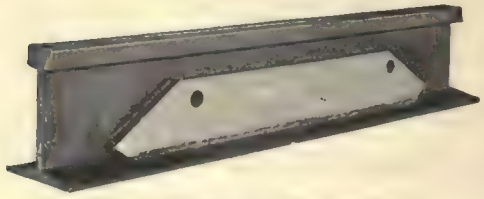
Candler Building

220 West 42nd Street, New York City

"Apex" Joint for Guard and Girder Rail







"Simplex" Joint for High Tee Rail

How Do You Fix Broken Rails?

If a rail breaks between joints just take out a couple of paving blocks and apply a pair of welded plates.

Do you wait until they are so worn out that it is necessary to replace them with new ones? Do you wait until the track is in such a condition that the passengers kick on the rough riding? Or are you one of these up-to-date persons who believe that an early remedy is the best cure.

That is just what the Indianapolis Electric Welder Outfit is. It's a sort of a "what to do before the doctor comes" in first aid to injured rails. Only it happens to be the doctor itself.

Indianapolis Joints and Bonding Plates are electrically welded and show greater conductivity than the rail itself. They eliminate current losses.

Indianapolis Switch & Frog Company, Springfield, Ohio

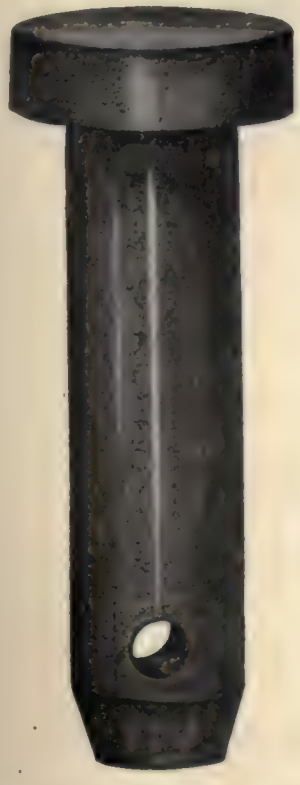
Users of Indianapolis Patented Welders, Joints and Welding Supplies Fully Protected.

BOYERIZED
PINS AND BUSHINGS
are appreciated for safety's sake

IF a brake pin went wrong on one of those 8 per cent. grades in Richmond, there would be some doings.

But the Richmond railway folks don't take that kind of a chance.

They use Boyerized Pins and Bushings because they want both minimum upkeep and maximum safety.



Remember:

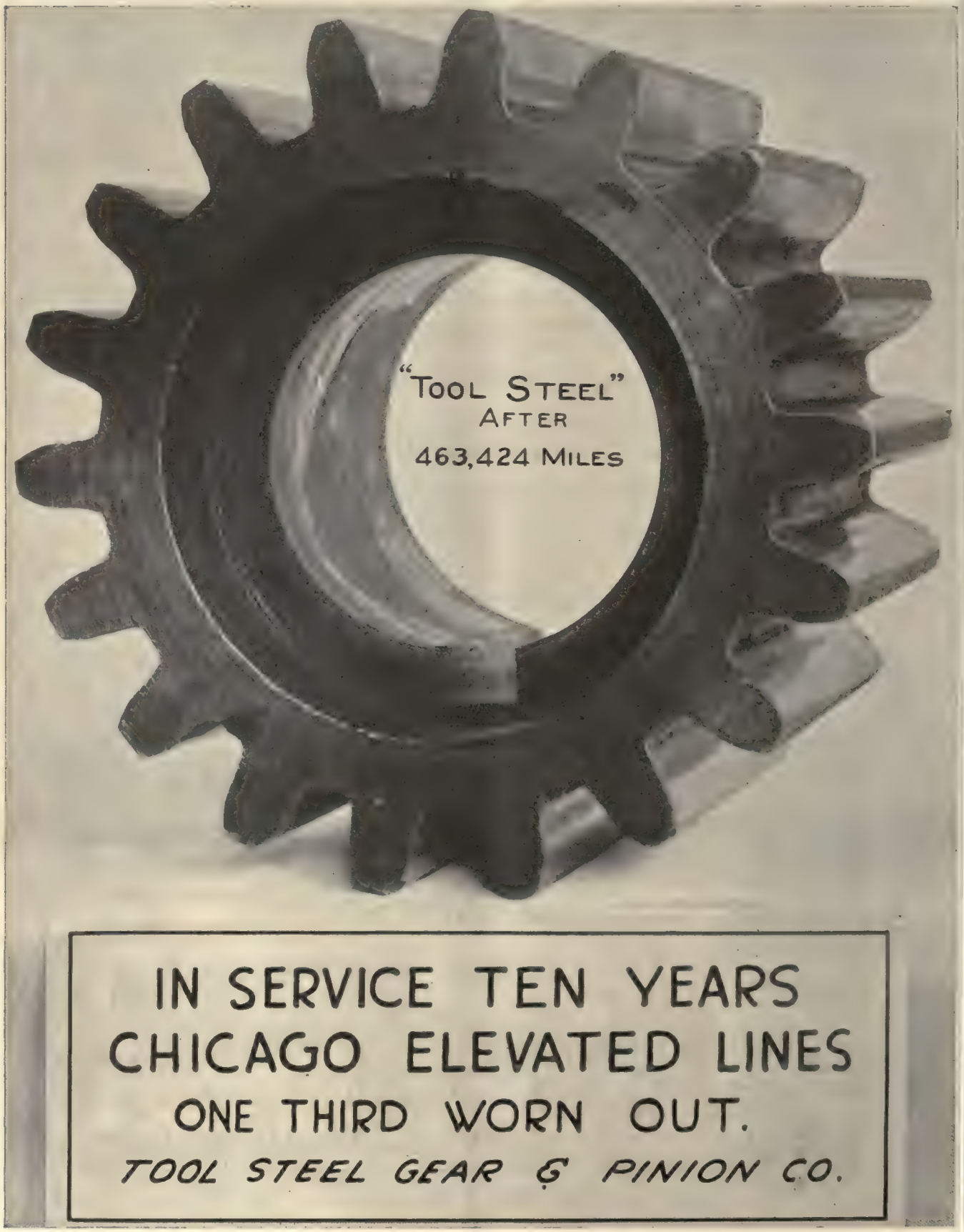
When you buy Boyerized products, you buy case-hardening that is uniform—a quality almost impossible in the ordinary blacksmith shop.

ELECTRIC RAILWAY SUPPLIES

Bemis Car Truck Company

SPRINGFIELD MASS

Just taken out of service long enough to get its "pitcher tooken". It's running again now.



ECONOMY IN REPLACEMENTS

IT'S THE CONSTANT "LITTLE REPAIRS" THAT BUILD UP BIG MAINTENANCE COSTS

If you will check up on the cost of the work that is being done along your line—not the big replacement and new construction work—but just the little jobs replacing a few rotted crossarms or a few decayed ties, or a bit of fencing, you will probably be surprised to find how much these items total in the course of a year.

Of course you are never going to get away from *all* of this sort of expense, but you can eliminate a surprisingly heavy proportion of it by using

CYPRESS

"THE WOOD ETERNAL"

not only on new construction, but on all replacement work.

ALL-HEART CYPRESS comes the nearest to being "decay proof" of any lumber suitable for railway use.

Several of the largest railway companies in the country have found the use of Cypress a paying investment.

THEY'VE LEARNED TO INSIST ON SEEING THIS MARK ON EVERY BOARD AND ON EVERY BUNDLE.

The data that substantiates this fact will be promptly furnished, if you ask for it.

SOUTHERN CYPRESS MFRS' ASS'N

1265 Hibernia Bank Building, New Orleans, La., or
1265 Heard National Bank Building, Jacksonville, Fla.

Atlas "A" Chemical Weed Killing



Insures Cumulative Results

When you consider that each annual treatment with ATLAS "A" Chemical Weed Killer costs less than the year previous, its **true economy** is grasped.

For instance, the second year's treatment costs **40-50% less** than the first. And remember—only one treatment a year.

But what of the cost of the initial application?—*much less than a* ***singlehand weeding.*** Also, we take **full charge** and solve your weed-killing problem at the rate of 15 to 50 miles a day.

Write for our estimate and full details.

Chipman Chemical Engineering Company, Inc.

95 Liberty Street, New York



Before Using Atlas "A"



After Using Atlas "A"

Welding Broken Gear Cases



fenders, frames and other metal parts of your equipment will keep your

LINCOLN Bonding Machine

in much demand during the time you are not using it for bonding.

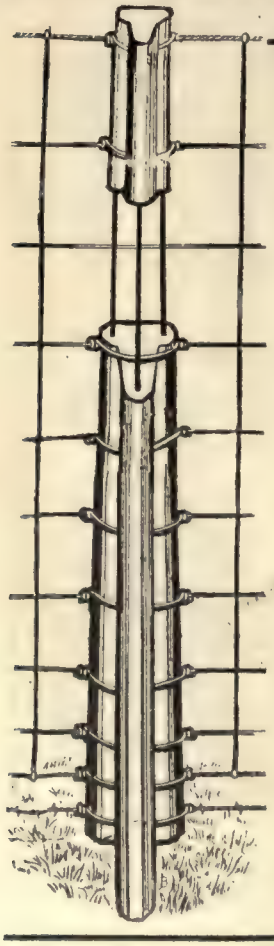
Easily portable about the barn or shop. Gives a strong carbon or metallic arc with the minimum in power consumption.

The upkeep charges are surprisingly low.

LINCOLN WELDED RAIL BONDS make each rail as one unit both mechanically and electrically. The track is left smooth over joints without trimming or regrinding. Used in the principal cities with complete success. Enthusiastically endorsed by prominent users. **Write for details.**

The Lincoln Bonding Co., 636 Huron Road, Cleveland, Ohio

AGENTS: Boston, Charles N. Wood Co. New York, Atlantic Welding Co. Philadelphia, Railway Track-work Co. Pittsburgh: Electrical Engineering & Manufacturing Co. Chicago, Holden & White, Inc. St. Louis, W. L. Rose Equip. Co. Milwaukee, W. C. Burdick. Los Angeles, Wigmore, Hall & Co. Canada, Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Winnipeg.



Seven Posts to the Sack

Just to save a few dollars makeshifts are sometimes put in.
This is no time to put in a makeshift fence—and pay for it again in the future.
No time, especially when with

Standard Fence Post Moulds

All Steel ***McElroy System***

you can get seven standard posts out of each sack of cement—and keep your labor charge very low. Note the T-shape of the posts—a big saving there.

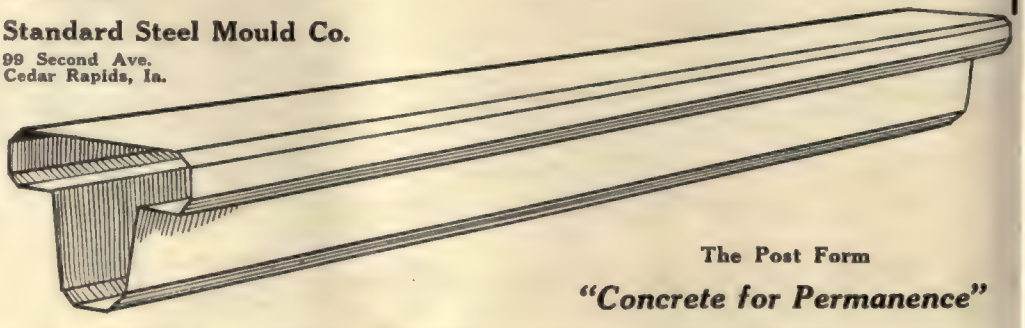
Assembled "Fool-proof" Towers insure uniform strength.

Why experiment? We offer you 20 years' experience as fence experts. Over 12 years of extensive manufacture of Concrete Fence Posts and Steel Moulds, handling hundreds of miles of fence contracts. More than a million posts in Iowa alone. Others in 38 States.

WE USE ONE-FOURTH-INCH ROUND DEFORMED BARS.

Write for full details of Standard Post Forms and Stan-Ste-MoC Building Rock Forms today.

Standard Steel Mould Co.
99 Second Ave.
Cedar Rapids, Ia.

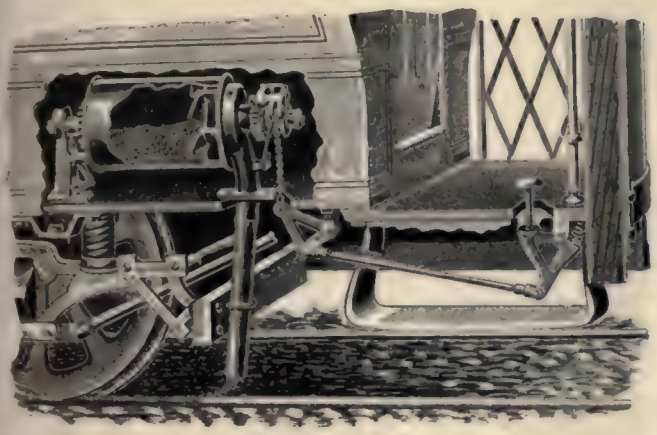


The Post Form

"Concrete for Permanence"

DANGERS

that lurk in the thunder-cloud
and in the slippery rails
can be successfully averted



SPRAGUE Rotary Sander

by



AJAX Lightning Arrester

ANDERSON SPECIALTIES

Albert & J.M. Anderson Mfg. Co.

289-293 A Street, Boston, Mass., U. S. A.

NEW YORK
135 Broadway

PHILADELPHIA
429 Real Estate Trust Bldg.

CHICAGO
105 S. Dearborn St.

LONDON, E. C., 48 Milton St.





The Duct That Spares the Cable

THAT smooth bore of Johns-Manville Fibre Conduit makes it ideal for cable pulling—no sharp bends or edges of cement, no offset sections—and its resistance to electrolysis, its mechanical strength and its insulating strength make it the best in service.

And not only is Johns-Manville Fibre Conduit superior as a duct, but it costs less to buy, less to ship and handle and less to install. For example: Johns-Manville Fibre Conduit is so light in weight that two men can carry 200 feet, enough for a single duct a city block long.

And in laying, there is a big economy. Less excavation and less back fill are required and no burlap or special cement is required at the joints. Just insert one length in another for they are machined to fit and line up. This makes for speed even with unskilled labor.

You will find the data in our new booklet especially interesting. Send for a copy.

H. W. JOHNS-MANVILLE CO.
New York City
10 Factories—Branches in 61 Large Cities

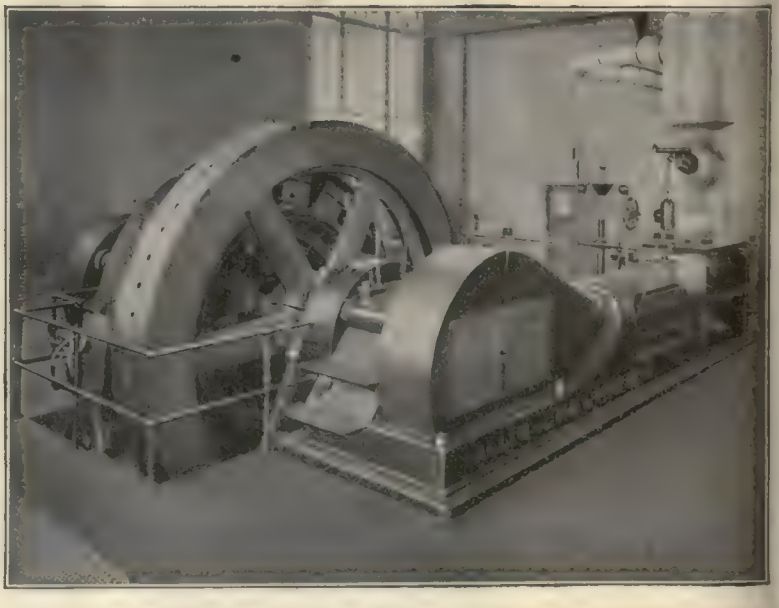
JOHNS - MANVILLE
Fibre Conduit

JOHNS-MANVILLE SERVICE
COVERS THE CONTINENT

WE HAVE BUILT
6,000,000 HORSE POWER

STEAM ENGINES
GAS ENGINES
OIL ENGINES

We also build
Steam Turbine
Condensers
Generators
Motors, Etc.



Cross-Compound Direct-Connected Corliss Engine Unit.

Our 40 years' experience is at your service.

ALLIS-CHALMERS MANUFACTURING CO.
MILWAUKEE, WIS., U. S. A.

A Timely and Patriotic Business Proposition

Cut Out the Waste!

NOW is the time to clean up!

Every piece of idle equipment, unnecessary material or scrap represents WASTE!

—waste

Money!
Time!
Space!
Labor!
Material!

—the *money* such equipment or material cost earns nothing and is not available for other use.

—the *time* it is idle is wasted when it can render service elsewhere.

—the *space* it occupies costs money and may be needed for other purposes.

—the *labor* of its manufacture is wasted and also the labor of producing a duplicate for the man who *can* use it.

—the *material* it represents would be a welcome addition to present short stocks.

Start your Spring clean-up with a resolve to cut out *all* this waste. Don't have material or equipment around that is not needed. Turn it into cash.

There never was a better market for either scrap or good used machinery. There never was a time when conservation of both materials and machinery counted for so much to the whole nation.

Buyers for junk or scrap are readily found in most localities. Buyers for material or good used machinery you don't need can best be reached through the *Electric Railway Journal* Searchlight Section.

THE UNITED STATES RUBBER CO. NEW YORK
FRICTION TAPES SPLICING

Friction and Splicing Tapes

for high dielectric strength and durability

Shield Brand Tapes

are unsurpassed for

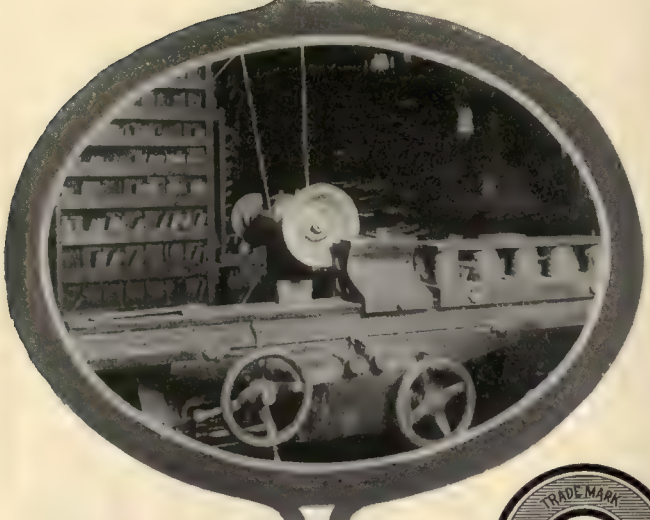
—lasting adhesiveness
—unusual service
—absolute satisfaction.

Made by the world's largest rubber manufacturer.

UNITED STATES RUBBER COMPANY US RUBBER SYSTEM AND ASSOCIATED COMPANIES

United States Rubber Company
Mechanical Goods Division
New York

Grinding Counterbore Cutters In Railway Shops



The illustration shows how one of the large Eastern railway shops has equipped a Norton Universal Tool and Cutter Grinding Machine with a magnetic table and special attachment for tool-room work.

In grinding counterbore cutters the special attachment holds the cutter in place while a taper cup ALUNDUM wheel, 7 x 2 x 1½, with ¾-inch rim and ½-inch back, grain 60, grade J, gives the right cutting edge for the greatest possible production.

TRADE MARK NORTON REGISTERED

Norton Company
Worcester, Mass.

New York Store
151 Chambers Street

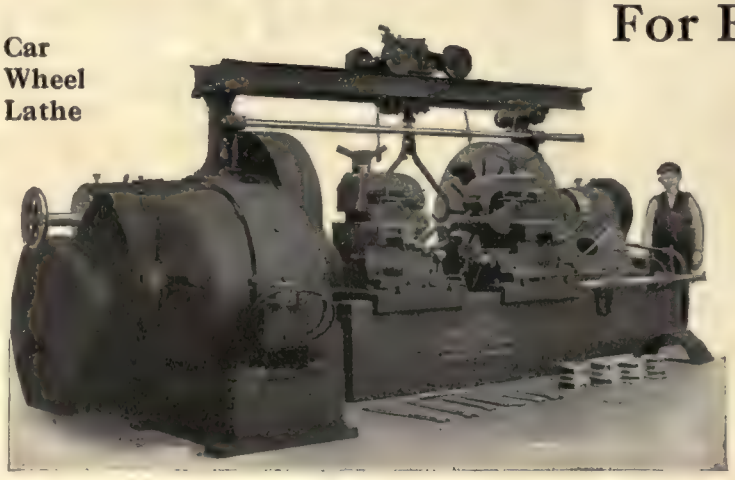
Chicago Store
11 N. Jefferson Street

869a

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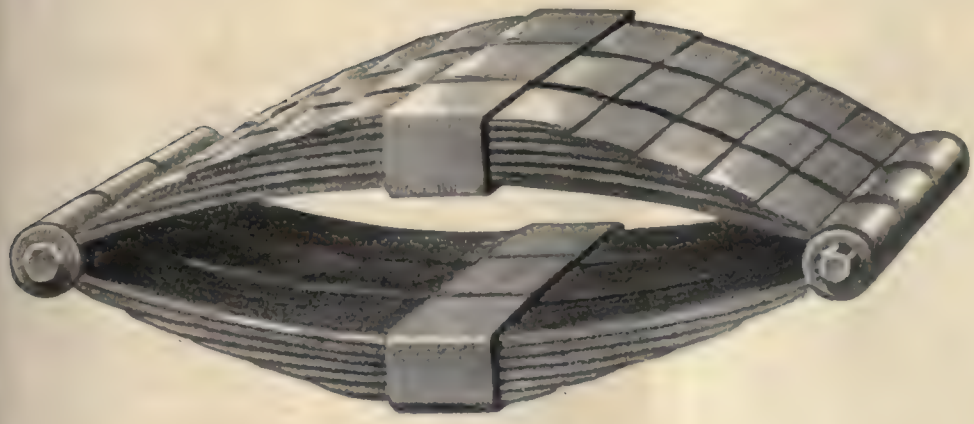
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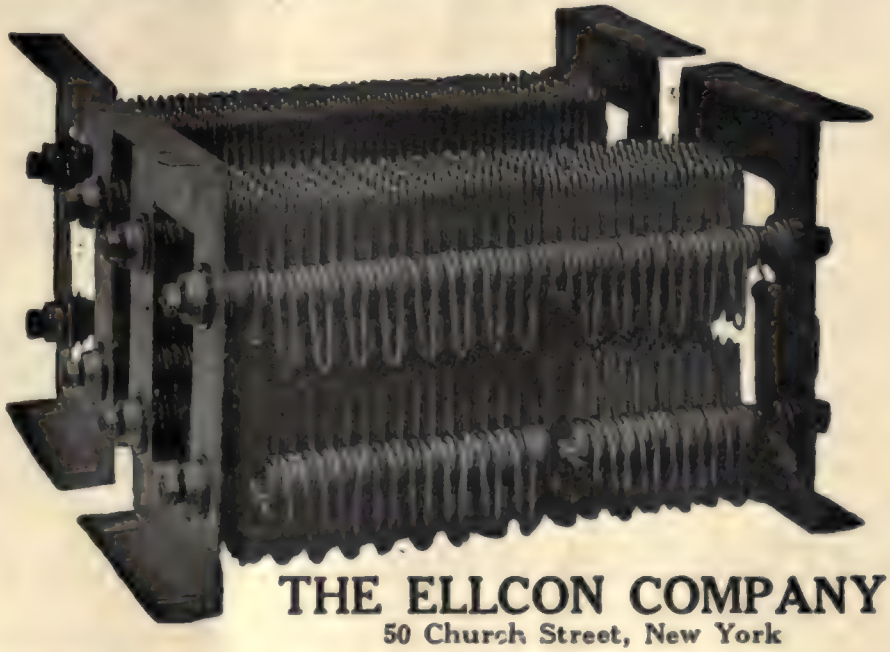
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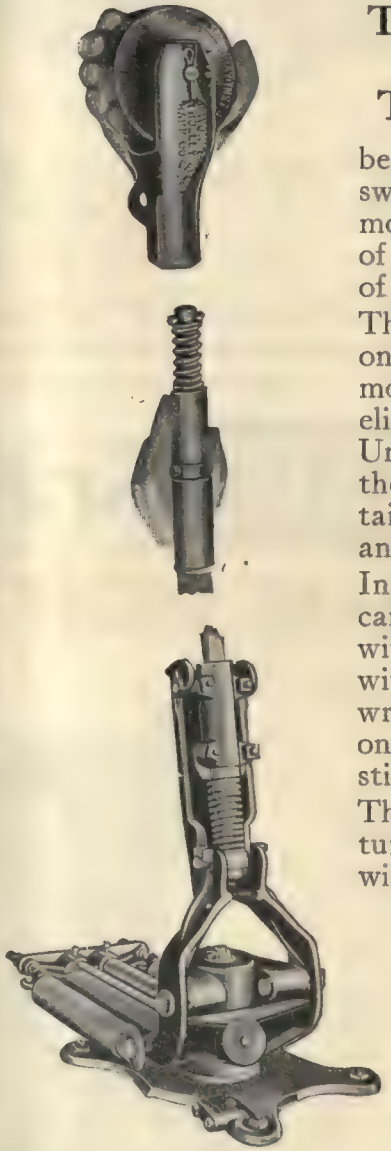
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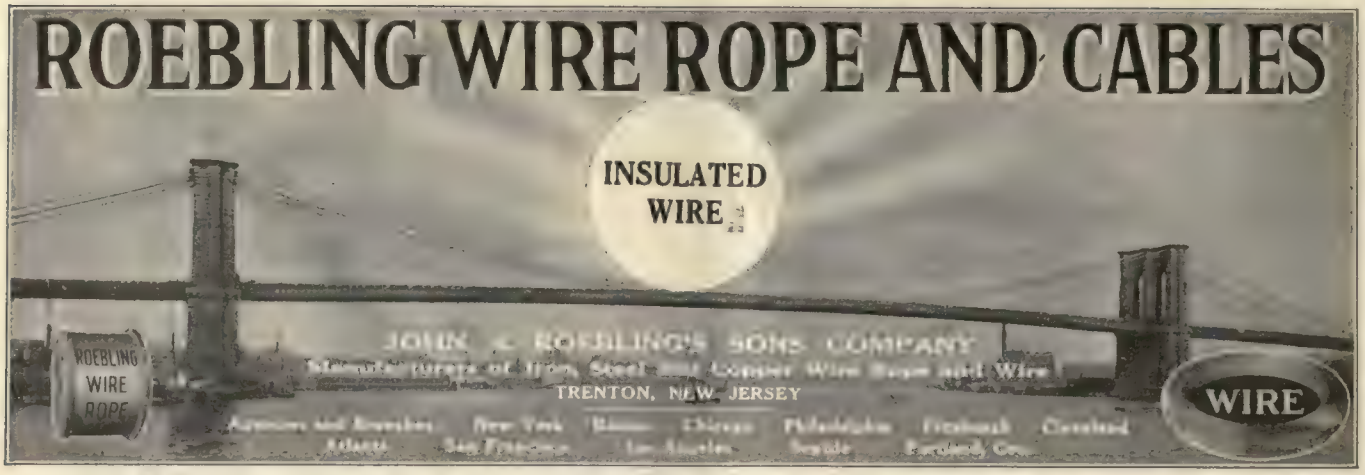
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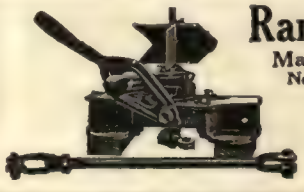
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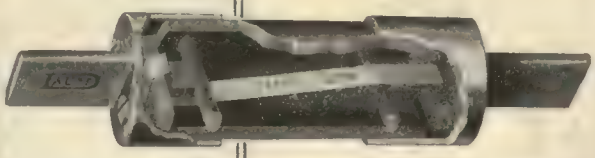
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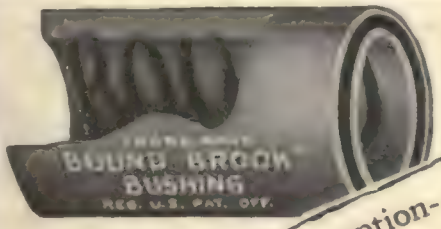
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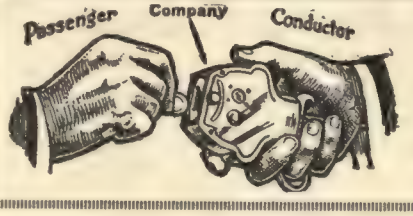
have always been made of entirely new metal, which accounts for their long life WITHOUT INJURY TO THE WIRE. Do not be misled by statements of large mileage, because a wheel that will run too long will damage the wire. If our catalogue does not show the style you need, write us—the LARGEST EXCLUSIVE TROLLEY WHEEL MAKERS IN THE WORLD.



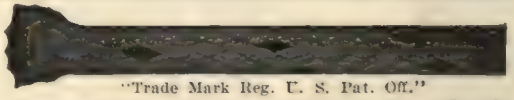
THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

Hot Air — Hot Water — Electric
HEATERS
Also Thermostatic Control
THE PETER SMITH HEATER CO., Detroit, Mich.

UNIVERSAL ANTI-SLIP TREADS
cars and station steps.
Universal Safety Tread Company
Waltham, Mass.



Direct Automatic Registration
By the
Passenger
Rooke Automatic Register Co.
Providence, R. I.



"Trade Mark Reg. U. S. Pat. Off."
Samson Spot Waterproofed Trolley Cord
Made of fine cotton yarn braided hard and smooth. Inspected and guaranteed free from flaws. Proved to be the most durable and economical. Samples and information gladly sent.
SAMSON CORDAGE WORKS, BOSTON, MASS.

Heating and Ventilating
Let us demonstrate to you how we can heat and ventilate your cars at the lowest possible cost.
The Cooper Heater Company
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PROVIDENCE FENDERS **H-B LIFE GUARDS**
The Consolidated Car Fender Co., Providence, R. I.
Manufacturers of The Providence Fender and H-B Life Guards
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Show origin and destination of every fare collected as well as other valuable traffic data.
The Bonham Recorder Co., Hamilton, O.

The "Hycap-Exide" Battery
for
STORAGE BATTERY STREET CARS
THE ELECTRIC STORAGE BATTERY CO
PHILADELPHIA

SEARCHLIGHT SECTION

Rotary Converters

60-Cycle

1—400-kw. General Electric Rotary Converter, type HC, form P, 6-phase, 60-cycle, 600-volt, D.C., 900-r.p.m., complete with switchboard equipment.

1—300-kw. Westinghouse Rotary Converter, 6-phase, 60-cycle, 600-volt, D.C., 1200-r.p.m., complete with transformer and switchboard equipment.

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4—500-kw. General Electric Rotary Converters, type HC, 3-phase, 25-cycle, 4-pole, 600-volt, D.C., 750-r.p.m. with transformers and switchboard equipment.

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1—300-kw. National Rotary Converter, type RT, 3-phase, 25-cycle, 550-volt, D.C., 500-r.p.m., with switchboard equipment.

1—300-kw. Stanley Rotary Converter, SKC, 3-phase, 25-cycle, 600-volt, D.C., 500-r.p.m.

1—250-kw. General Electric Rotary Converter, type TC, 3-phase, 25-cycle, 550-volt, D.C., 750-r.p.m.

We shall be glad to mail complete list of Electrical, Steam and Hydraulic Machinery upon request.

MacGOVERN & COMPANY, Inc.
114 Liberty Street, New York, N. Y.

Complete Power Plant

Delivery Approx. May 1st

2—780 KVA Westg. Turbo Outfits, 3-ph. 60-cy., 2400-V., 3600 R.P.M., complete with switchboards and exciter units; also condensing apparatus. 4-338 H.P. Keeler Water Tube Boilers with breeching, stack, pumps.

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1—2500 KVA. Gen. Elec. Curtis Horz. Turbo Outfit, 2-phy., 60-cy., 2300-V., 3600 R.P.M., 150-lb. steam pressure, with Westg. Le Blanc Condenser.
1—500 Kw. Gen. Elec. Curtiss Turbo Outfit, 3-ph., 60-cy., 2300-V., 1800 R.P.M., 150-lb. steam pressure. Vert. type.
1—500 Kw. Westg. Horz., 3-ph., 60-cy., 360-V., 3600 R.P.M. Turbo Outfit.
1—100 Kw., Gen. Elec. Turbo Outfit, 3-ph., 60-cy., 2300-V., 3600 R.P.M., 125-lb. steam pressure.

ARCHER & BALDWIN, Inc.
114-118 Liberty St., New York, N.Y. Telephone 4337-4338 Rector

WANTED

ONE CAR WHEEL BORING MACHINE

Boring wheels 36 in. in diameter maximum.
Either belted or motor driven.

The Hagerstown & Frederick Ry. Co.
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FOR SALE

GENERATOR AND ENGINE

One Westinghouse 250 KW., direct current Generator, E.M.F. 575, amps. 435, speed 450, Serial No. 162052, belt driven.

Hamilton Corliss engine, 20 in. x 42 in., wheel 15 ft. diameter, 36 in. face, all in first-class condition, immediate delivery.

HENRY A. HITNER'S SONS CO.
Station K, Philadelphia, Pa.

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PINIONS

Eleven, new, for Westinghouse No. 56 Motor, 28 tooth, 5-in. face, 3-in. pitch, 3-in. taper bore.

Cleveland, Alliance & Mahoning Valley R.R. Co., Ravenna, Ohio

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.
We positively own these Rails and offer same in carload lots and over.
25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.
Immediate shipment guaranteed and prices very attractive.
Carload and less than carload inquiries and orders solicited.
Rails cut to length for structural purposes. Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Building, Pittsburgh, Pa.

Direct Current Belted Generator

1—500-kw., 550-V., 320 r.p.m. Cp. Wd. Westinghouse 3 bearing direct current generator.

DUQUESNE Electric & Mfg Co.

Write, wire or 'phone our nearest office, Pittsburgh, Pa., or 230 La Salle St., Chicago, Ill.

RAILS

RELAYERS—NEW

If you have any to sell, 12 lb. to 100 lb., write, wire or phone us.

GENERAL EQUIPMENT CO
30 Church Street, New York City

CLEVELAND ARMATURE WORKS
Cleveland, Ohio

Everything in the Line of Repairs to Electrical Machinery

Complete Armatures, New Armatures, Rewound Armature Cores, Armature Shafts, Armature Coils, Fields and Commutators.

Established 22 Years.

SEARCHLIGHT SECTION

Rails! Cars! Wire!

Material and Equipment
of the
St. Joseph Valley Railway Company
and the
St. Joseph Valley Traction Company
Elkhart, Indiana

Just purchased from the Receiver of the above named Companies their entire Tracks, Rails, Machine Shop Tools, Implements, Wire, Cars, Rolling Stock and material of all kinds.

The St. Joseph Valley Railway Company extended from the town of LaGrange, Ind., to Columbus, Ohio, and the St. Joseph Valley Traction Company extended from the City of Elkhart, Ind., to the town of LaGrange, Ind.

The material is in excellent condition and represents approximately the following:

75 miles of 70-lb. Standard Steel Rails.
240,000 Ties.
2—Steel Bridges.
1—40-ton Locomotive, 8-wheels.
1—45-ton Locomotive, 10-wheels.
1—65-ton Mogul Locomotive, 8-wheels.
1—Combination passenger car.
3—Passenger Cars.
3—Fairbanks-Morse Gasoline Cars.
5—Freight Box Cars.
6—Freight Flat Cars.
1—Box Caboose Car.
4—Engine Water Tanks.
1—Ballast Car.
1—Baggage Car.
9 miles of 350,000 C. M. copper Feed Wire.
10 miles of 000 copper Trolley Wire.
36 miles of No. 9 Iron Wire.
46 miles of No. 10 copper Telephone Wire.
2—Section Speeders.
Shop Machines.
Tools.
Implements.
Section Men's Tools, and
A large quantity of miscellaneous apparatus.

Immediate delivery can be given on any part of this equipment. Inspection can be made from my office in the city of LaGrange, Ind. Inquiries should be addressed to

BENJ. HARRIS
Liquidator
LaGrange, Ind.

EQUIPMENT FOR SALE

Two Frequency Changer Sets; motors No. 695658 and No. 659659. Power, factor 1; type ATI; class, 10-450-720; form, C; hp., 575; speed, 720; volts, 13,200; amperes, 19.5; cycles, 60.

Generators No. 695656 and No. 695657. Power, factor .8; type, ASI; 4-500-720; form, C; kw., 400; volts, 6600; amperes, 76; cycles, 25; speed, 720.

With one field rheostat for each motor, and one field rheostat for each generator, with sprockets and handles.

One Exciter, No. 440040, compound wound; type, CVC-115; form, AA-1080; kw., 14; amperes, 56; speed, 1800; generator voltage, 220-250. Includes field rheostat connected to 3-phase, 60-cycle, 220-volt motor.

One Exciter, No. 440001, compound wound; type, CVC-115; form, AA-1731; kw., 7½; amperes, 70; speed, 1800; generator volts, 250. Includes field rheostat connected to a 3-phase, 60-cycle, 220-volt motor.

Above equipment about two years service, given good care and attention, in first-class condition.

Purchasing Department, **VIRGINIA RAILWAY & POWER COMPANY**
Richmond, Virginia

Power Equipment

BOILERS

2—400 h.p. Wickes.
3—300 hp. Wickes, with Murphy Stokers. Fine condition; 150 lb. pressure.

GENERATOR

300 k.v.a. Westinghouse, 440-volt, 60-cycle.

STACK

78-in. x 100-ft., self-supporting.
54-in. x 100-ft., stack.

PUMPS

2—10 x 6 x 10-in. Worthington, outside packed.

HEATERS

2000 h.p. Goubert.
1200 h.p. Goubert.
1000 h.p. Cochrane.
Send for our complete list.

Wickes Machinery Company,
Jersey City, N. J.

Keep your eye on the Searchlight and your advertisements in it.

FOR SALE

EQUIPMENT

10 large Cars fitted with G.E. equipment.

3 large cars fitted with Allis-Chalmers equipment (seating capacity for both, 42 passengers). Constructed by Preston Car and Coach Company, Preston, Ontario.

2000—13-in. Bonds.

1600 pairs 80-lb. Continuous Rail Joints, A.S.C.E. Section.

571 Rail Braces.

Plans and specifications can be supplied by

STREET RAILWAY DEPARTMENT
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RELAYERS—NEW

Write, wire or phone us if you need any. 8 lb. to 100 lb. section.

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CAR BARGAINS

OPEN and CLOSED MOTOR and TRAIL

Write for Price and Full Particulars to

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Position you want
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Are you using the Searchlight?

190 Tons High T

RELAYING RAIL

60 lb.—5¾-in. height; I. S. Co.'s Section No. 6012

Immediate shipment.

ARTHUR S. PARTRIDGE, 415 Pine St., St. Louis, Mo.

MISCELLANEOUS WANTS

Wanted to Rent or Purchase

Second-Hand double trucks city or suburban cars for operation on 550 600 volt, direct current. Westinghouse 112-B motors preferred. Gige full details. Tide Water Power Company, Welmington, N. C.

POSITIONS VACANT

EXPERIENCED car builders and cabinet makers for work on city and interurban cars wanted. New construction, and repairs. Steady employment in a town of 15,000 inhabitants in Indiana. P-149, Elec. Ry. Journal, Chicago.

MASTER mechanic for a hondred-car road, city and interurban service. Must be strictly sober and capable of handling men efficiently. Ability to maintain equipment at a high standard a necessary qualification. State salary expected. P-157, Elec. Ry. Journal, Philadelphia.

REPAIRMAN wantedAn all around good electric railway car repairman, small road operating four miles of track. Want a man who can do the line work as well as the car repairing. Give experience, references and salary wanted. C. F. Smith, Cheyenne, Wyoming.

THREE good pitment wanted, 45c. per hour, eight hours, time and half overtime, good working conditions. Will refund one-half of railroad fare after six months' service. Reference first letter. P. 155, Elec. Ry. Journal, San Francisco.

Avoid Delay

Receive replies to your Want Advertisements *direct!*

It takes from one to three days longer to receive answers to your advertisements through our office, than it would if they were addressed to you at your home, office, or Post Office box direct.

We fully appreciate that there are often good reasons why Want Advertisers do not wish to publish their names. Even in such instances, the plan we suggest will not be found objectionable.

Sign your advertisement with initials (your own or others), care of your home, office, or Post Office box. This will save the time now wasted in receiving replies at our office and forwarding them on to you.

Remember that minutes, even seconds—have won or lost both men and jobs and business opportunities. Start right by arranging to receive your replies first hand.

SEARCHLIGHT SECTION

In Replying to "Blind" Ads

be careful to put on envelope the key number in the ad. and also local address of office to which reply is sent.

10th Ave. at 36th St., New York.
1570 Old Colony Bldg., Chicago.
657 Leader-News Bldg., Cleveland.
935 Real Estate Trust Bldg., Phila.
501 Rialto Bldg., San Francisco.

Important

Original letters of recommendation or other papers of value should not be enclosed to unknown correspondents—send copies.

POSITIONS VACANT

FOR SALE

1—550 V.

RAILWAY GENERATING UNIT

consisting of McIntosh & Seymore Compound Condensing engine, 13 in. x 26 in. x 30 in., 150 rpm., 120 lbs. boiler pressure and 364 amp. General Electric MP. Generator. All in first-class operating condition.

AUSTIN STREET RAILWAY CO.,
Austin, Texas.

POSITIONS WANTED

AUDITOR, thoroughly capable in public utility accounting solicits change. Sixteen years' experience, age 39, married, references. PW-73, Elec. Ry. Journal, Cleveland.

EFFICIENT Manager, age 35, desires opportunity to demonstrate ability to economically operate property or properties and maintain unusually harmonious relations with public and employees. Accustomed to full uathority and responsibility. Want larger field-property having over $500,000 gross revenue. References, past deeds and present employers. PW-156, Elec. Ry. Journal, Philadelphia.

GENERAL auditor or secretary-treasurer Public Utility Company wants position. Twenty years' experience gas, electric, street railway accounting. Minimum salary $3000. PW-154, Elec. Ry. Journal.

Electric Railway Man Who Can Write Advertising

Somewhere there is a live wire who is thoroughly familiar with the electric railway field; a man who understands the problems of selling to this field, is on intimate terms with the equipment used, and who, in addition, knows something about advertising—the more the better.

Such a man is offered a position of responsibility in the Advertising Service Department of a leading technical publishing company; here he will have ample opportunities to develop and supervise the work of others. This position is in New York and quick action is required.

If your letter shows that you possess the qualifications you will have no difficulty in securing an immediate interview.

P153—Elec. Ry. Journal.
10th Ave. at 36th St., New York City

Undisplayed Cards Under Positions Wanted Cost 60 Cents for 20 Words

Keep Your Eyes on the Journal Searchlight Section

Machinery Advertisements Undisplayed Cost $1.50 for 30 Words

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Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors

Advertising, Street Car.
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Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Holden & White, Inc.

Alloys, Steel & Iron (see also Bearings and Bearing Metals.)
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improvement Co.

Automobiles and Buses.
Brill Co., The J. G.

Axle Straighteners.
Columbia M. W. & M. I. Co.

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Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
National Railway Appliance Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse Elec. & M. Co.

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Columbia M. W. & M. I. Co.

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Electric Service Supplies Co.
International Register Co., The

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Johns-Manville Co., H. W.
Nichols-Lintern Co.

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Electric Storage Battery Co.

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Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
More-Jones Brass & Metal Co.
St. Louis Car Co.
Westinghouse Elec. & M. Co.

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Holden & White, Inc.

Bearings, Oilless, Graphite, Bronze & Wood.
Bound Brook Oil-less Bearing Co.

Bearings, Roller and Ball.
Gurney Ball-Bearing Co.
S K F Ball Bearing Co.

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Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

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Niles-Bement-Pond Co.
Zelnicker Sup. Co., W. A.

Boilers.
Babcock & Wilcox Co.

Boiler Cleaning Compounds.
Johns-Manville Co., H. W.

Boiler Coverings.
Johns-Manville Co., H. W.

Boiler Tubes.
National Tube Co.

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American Steel & Wire Co.

Bonding Apparatus.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
Imperial Brass Mfg. Co.
Ohio Brass Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Lincoln Bonding Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

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Niles-Bement-Pond Co.

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Kilby Frog & Switch Co.

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Electric Railway Equipment Co.
Hubbard & Co.
Lindsley Bros. Co.
Ohio Brass Co.

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Holden & White, Inc.
Westinghouse Traction Brake Co.

Brake Shoes.
Amer. Brake Shoe & Fdry. Co.
Barbour-Stockwell Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
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Electric Railway Equipment Co.

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Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
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Holden & White, Inc.
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American Bridge Co.

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Zelnicker Supply Co., W. A.

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Anderson Mfg. Co., A. & J. M.
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General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
United States Graphite Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
United States Graphite Co.

Buckets, Grab.
Beaumont Co., R. H.

Bunkers, Coal
American Bridge Co.
Beaumont Co., R. H.

Bushings, Case Hardened and Manganese.
Bemis Car Truck Co.

Bushings, Graphite and Wooden.
Bound Brook Oil-less Bearing Co.

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Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc.—See those headings.)

Car Trimmings. (For Curtains, Registers, Doors, Seats, etc.—See those headings.)

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Brill Co., The J. G.
Kuhlman Car Co., G. C.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.
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Cars, Section.
Mudge & Co.

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Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
St. Louis Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.

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Amer. Brake Shoe & Fdry. Co.
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Horne Mfg. Co.
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Wood Co., Chas. N.

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Hubbard & Co.
Klein & Sons, Mathias
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

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Cleveland Armature Works.
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D & W Fuse Co.
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Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Coils, Choke and Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
International Register Co., The

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
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Wood Co., Chas. N.

Commutator Truing Devices.
General Electric Co.

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Cameron Elec'l Mfg. Co.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
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General Electric Co.
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Jaeger Machine Co.

Condensers
Allis-Chalmers Mfg. Co.
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Westinghouse Elec. & M. Co.

Conduits, Flexible.
Tubular Woven Fabric Co.

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Johns-Manville Co., H. W.

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Dossert & Co.
Westinghouse Elec. & Mfg. Co.

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Their superiority is so marked, so easily demonstrated by test, that only one decision will be possible after you have made comparison

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One of the Portable Electrodynamometer Group, which also includes Model 310 Single Phase and D.C. Wattmeter, Model 329 Polyphase Wattmeter and Model 341 A.C. and D.C. Voltmeter.

The characteristics of the group are extreme accuracy (guaranteed within a fraction of 1 per cent. full scale value), adaptability for use on circuits of any commercial frequency and any wave form, great overload capacity, low moment of inertia, effective damping and shielding, and the legibility and remarkable uniformity of the hand calibrated scales.

Weston Indicating Instruments include a great variety of groups for portable or switchboard service on A.C. or D.C. Circuits, Instruments designed expressly for testing and laboratory use, for motor car and boat electrical systems, and many others for special purposes. Write for Bulletins or Catalogs describing those which interest you.

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Post-mortems are unpleasant things—both the post-mortem hearing on some wreck and the post-mortem analysis of the broken rail that caused it.

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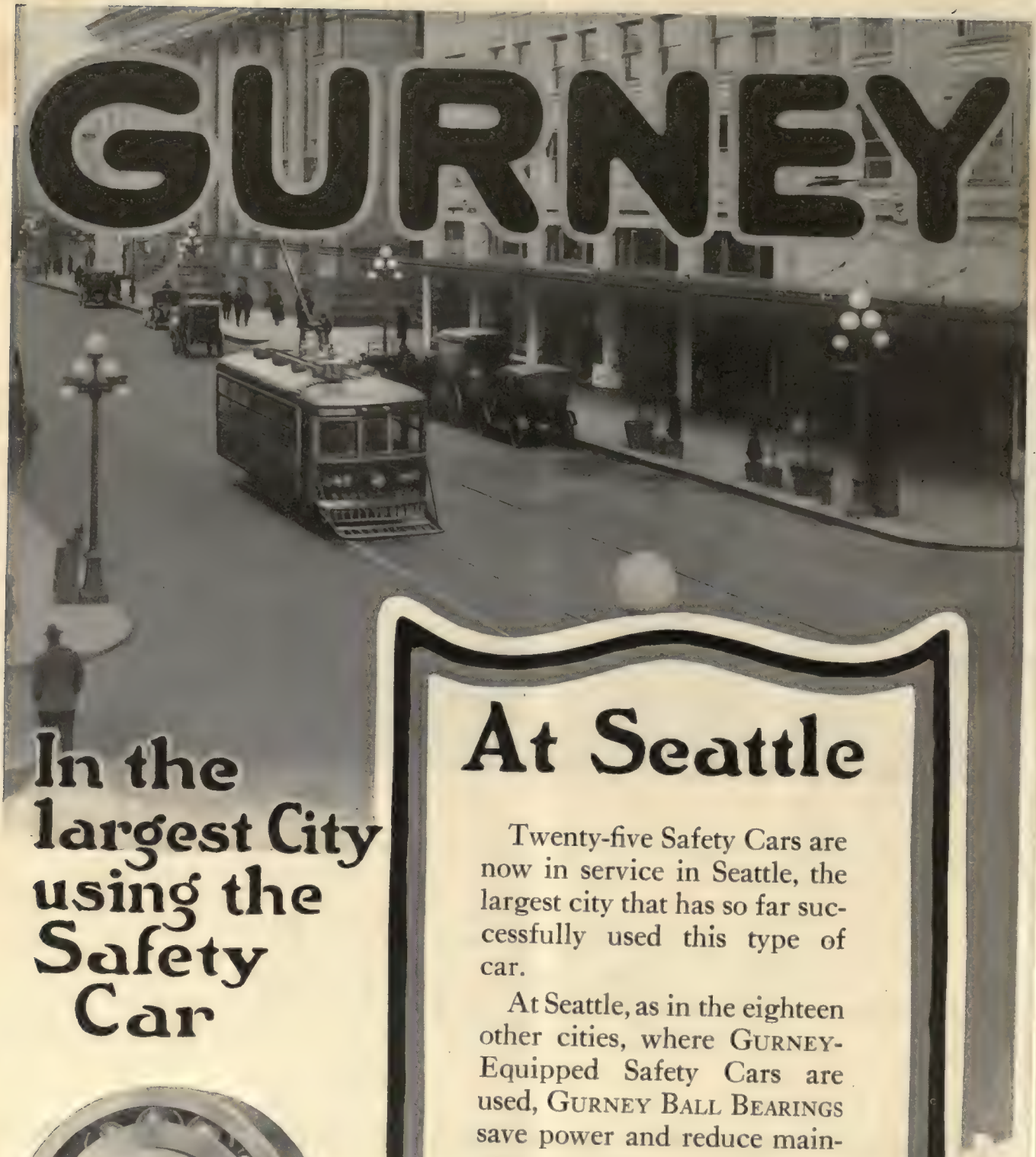
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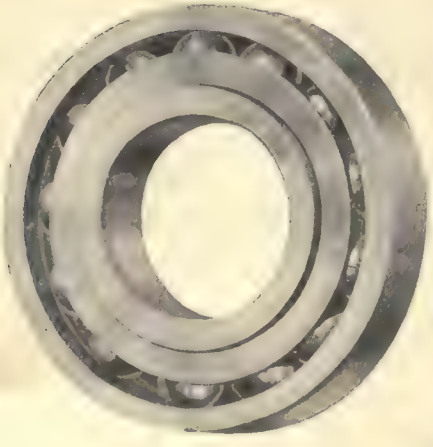
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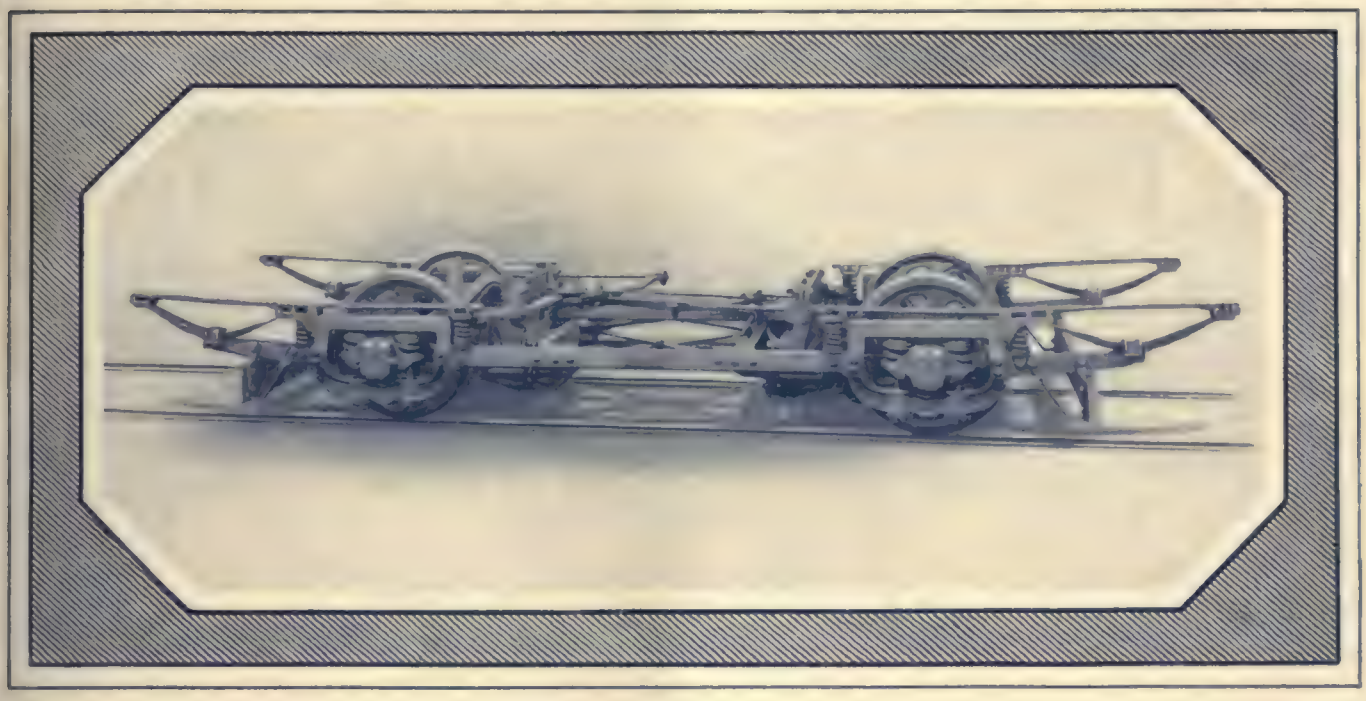
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Gurney Ball Bearing Company

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271



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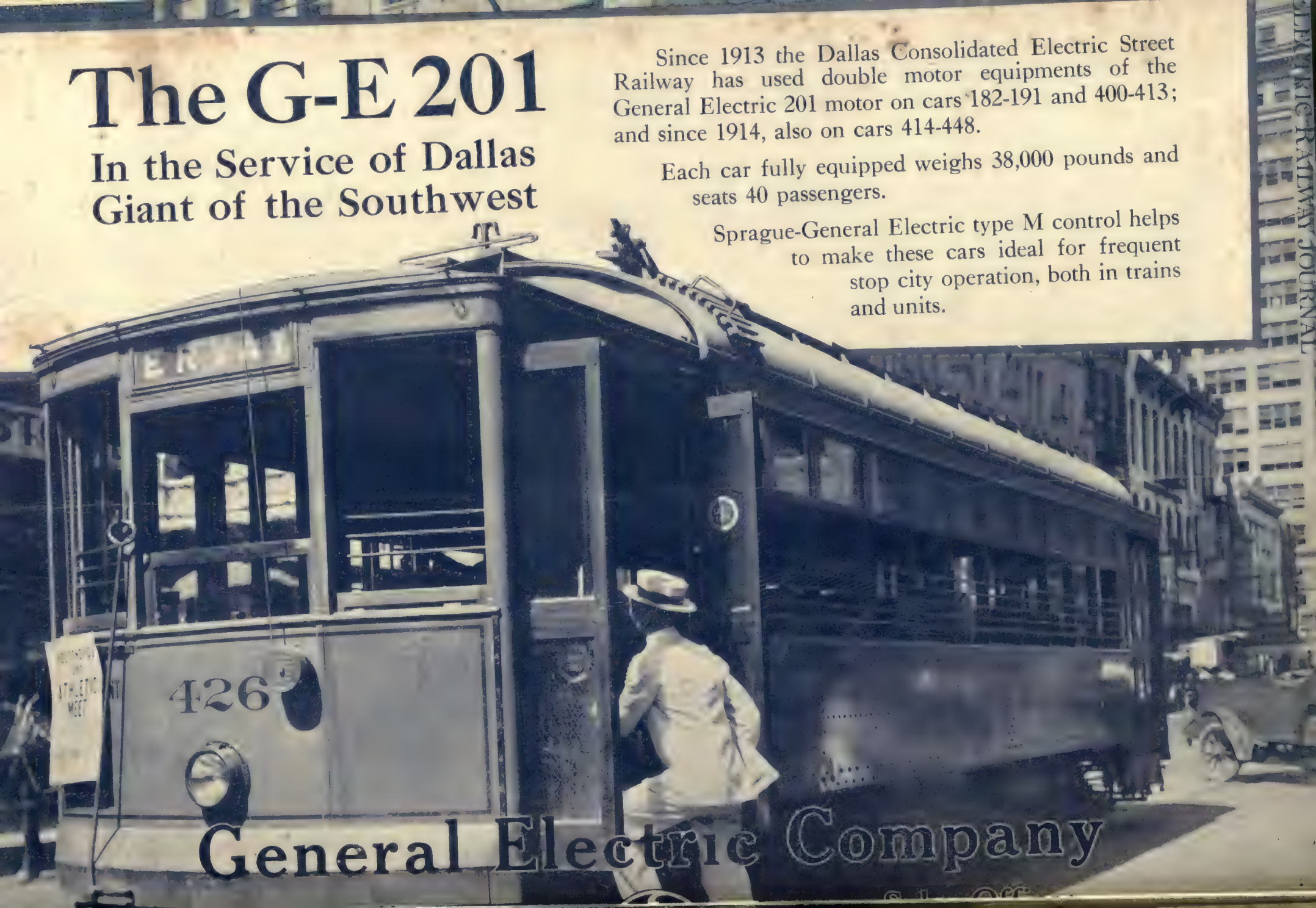
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ELECTRIC RAILWAY JOURNAL

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East Pittsburgh, Pa.

Westinghouse

Vol. 51, No. 21 New York, May 25, 1918 Pages 999 to 1038

Electric Railway Journal

H. W. BLAKE, *Editor*

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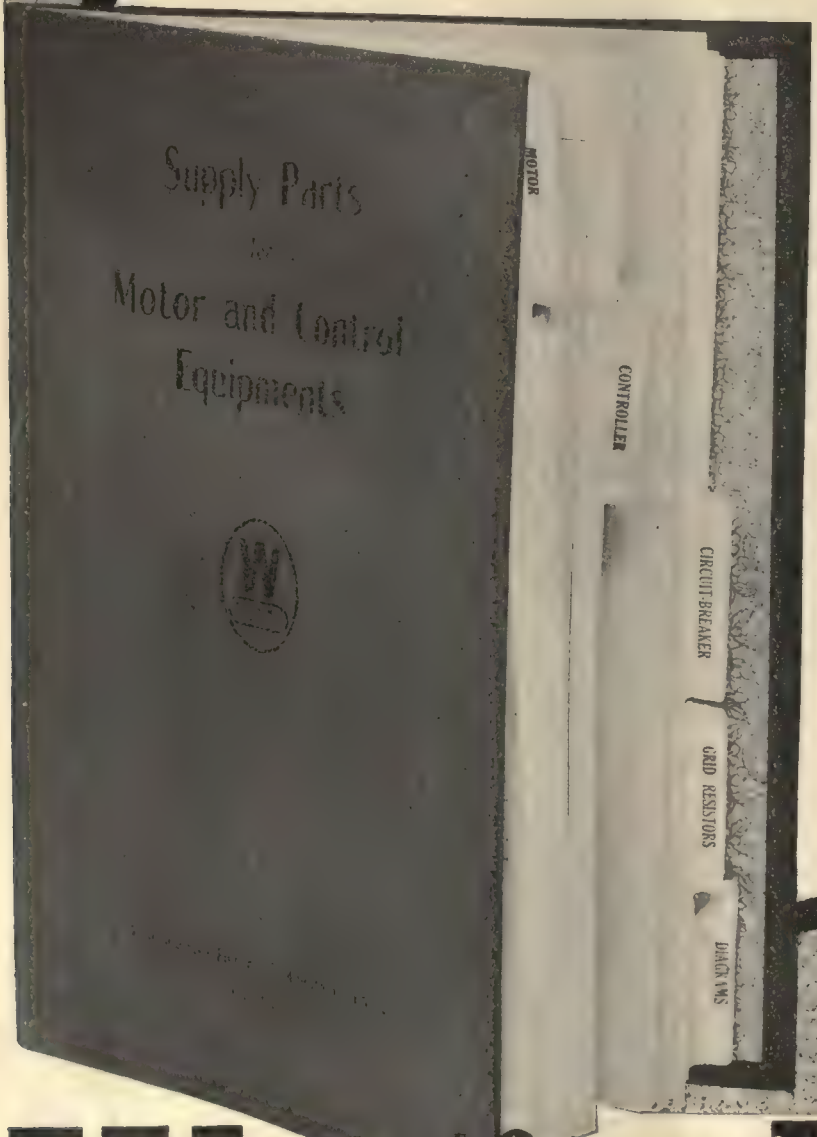
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2081

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O-B Bonding Engineers are Return Circuit Specialists. They direct their energies toward making return circuits more efficient.

They have conducted extensive laboratory tests—they have run tests on scores of roads from the Atlantic to the Pacific.

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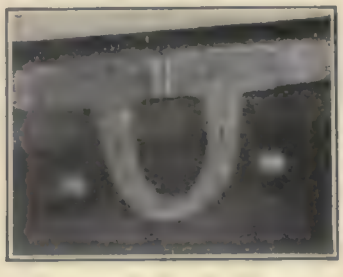
These are instances—picked out at random—of their practical constructive work.

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Tell us your problems.



O-B Compressed Terminal Bond
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Good bonding saves money. O-B Bonds are good bonds.



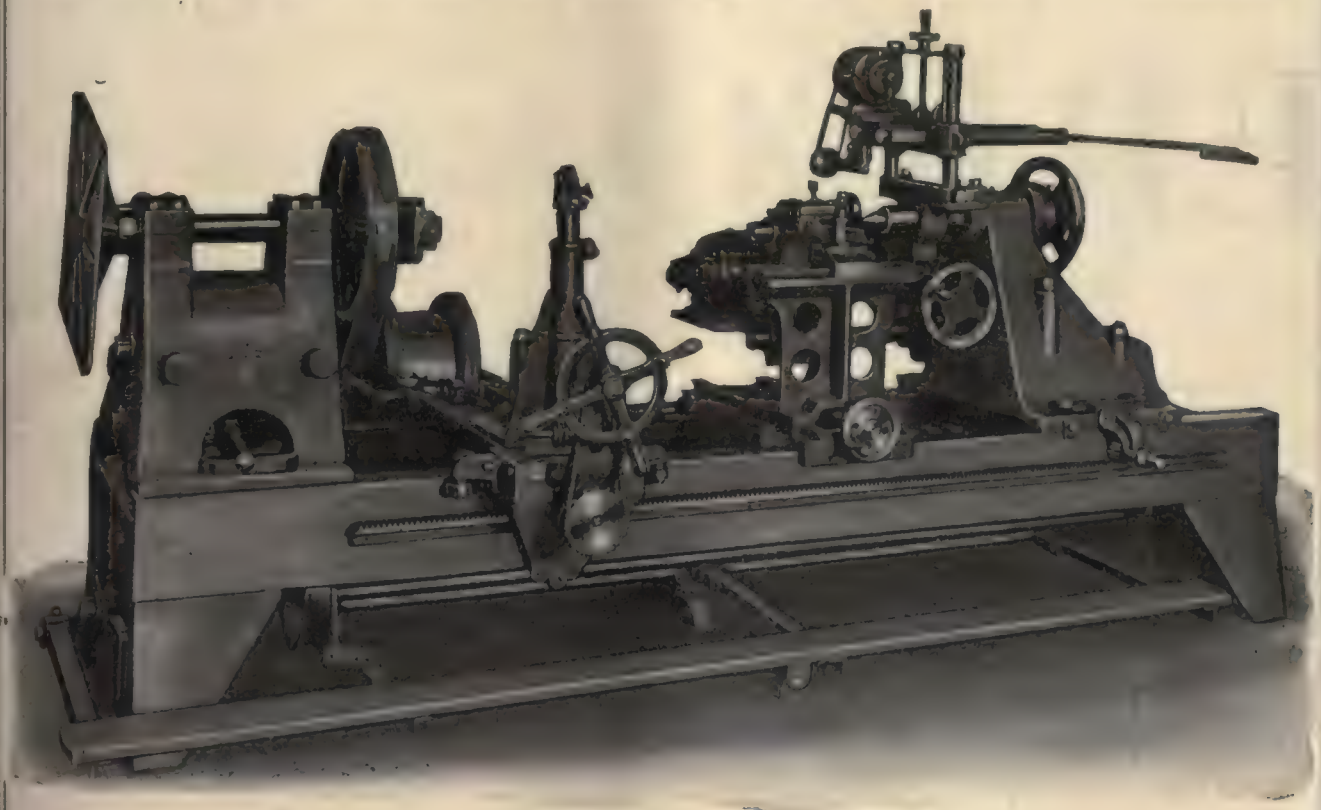
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Cleveland

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Tennessee Metal Culvert Co.
Texas, Dallas
Wyatt Metal Works
Texas, El Paso
Western Metal Mfg. Co.
Texas, Houston
Lone Star Culvert Co.
Utah, Woods Cross
Utah Corrugated Cul. & Flume Co.
Virginia, Roanoke
Virginia Metal & Culvert Co.
Washington, Spokane
Spokane Culvert & Tank Co.
Wisconsin, Eau Claire
Bark River Bridge & Culvert Co.

Canada—Canada Ingot Iron Co., Ltd., Guelph, Sherbrooke, Winnipeg, Calgary.

Of Course Business Men Approve

THE Chamber of Commerce of the United States is composed of men with a keen sense of practical values. They know how to listen to facts and give prompt decisions in accordance therewith. The business men of the country were running true to form when last week in Chicago they adopted the following resolution:

> *"The Chamber of Commerce of the United States recommends to state and local authorities that they recognize the unusual and onerous conditions with which public utilities are contending, and that in the interest of the nation, of business and of the public they give prompt and sympathetic hearing to the petitions of such utilities for assistance and relief."*

WE ARE glad that another ally has joined the forces of those fighting for utility preservation. Most of the commissions are courageously trying to do their duty, but the public must be made to feel more deeply the nation's need for utility maintenance and extension.

Reprinted from Editorial Pages *Electric Railway Journal*, April 20, 1918.

Electric Railway Journal, Tenth Avenue at 36th Street, New York

Member Audit Bureau of Circulation



The Time Element

This is what was foremost in our mind when we first built the Indianapolis Portable Electric Welder. We knew that a road frequently tolerated a damaged track, because ordinarily much time was used to fix it.

The Portable Electric Welder takes but a few hours to build the rail up by means of electric welding. The rail is ground into smooth tractive surface, as good as new.

This machine is equally effective in shop operation. It will reclaim thousands of dollars' worth of broken car equipment in a year and avoid the necessity of new parts.



Users of Indianapolis Patented Welders, Joints and Welding Supplies fully protected. Broken track work need no longer prove a much-to-be-feared "bugbear." The Indianapolis Portable Electric Welder will straighten things out in no time.

Indianapolis Switch & Frog Company

Springfield, Ohio



Fifteen Million Dollars in One Year For Rebuilt Track

Statistics show that last year (1917) electric railways in the United States and Canada rebuilt 375.4 miles of track.

This was not *new mileage*—not extensions. It was old track replacement. The making good of old track that had "gone to pot." According to the best available estimates that track cost certainly not less than $40,000 per mile—a total for all of it of fifteen million dollars.

That's an awful lot of money for a relatively very small amount of track.

Let's assume that five or six years ago this track had been put in good shape with the aid of a

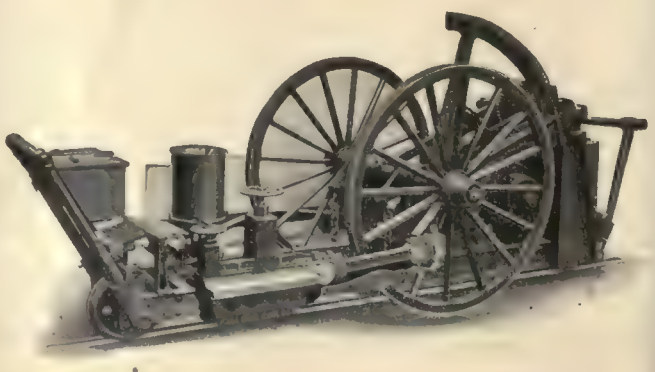
RECIPROCATING TRACK GRINDER

and with the further aid of one of these easily operated machines had been kept in good condition.

This would have cost something, of course. But its cost compared to that fifteen million would look a good deal like a brick compared to the Woolworth Building.

How about the condition of *your* track now?

Is it not possible that a Reciprocating Grinder put to work for you *now* might save *you* some of this big calibre expenditure four or five years from now? It is surely worth careful consideration.



Railway Track-work Company

30th and Walnut Streets, Philadelphia

AGENTS: Holden & White, Inc., 343 S. Dearborn St., Chicago.



© Social Press Service

Conductresses on National Pneumatic Cars in New York City

National Pneumatic Door and Step Control

SPEEDS THE CAR

Perhaps, when your conductor is just beginning his day's work—*and has nothing else to divide his attention*—he can operate the door and step mechanisms by hand practically as fast as by means of air.

But on a schedule of eight stops per mile, eighty stops an hour, *eight hundred* stops a day, Mr. Conductor or *Miss Conductress* would soon have to slow up and *lose one second or more at every stop.*

Whereas the operation of doors and steps by air—

Is just as *snappy*, just as *speedy* and just as *safe* at the crest of the rush hour—

As it was for the first stop made out of the carhouse.

National Pneumatic Door and Step Control
Takes the Fatigue Out of
Platform Service

NATIONAL PNEUMATIC COMPANY INC.

50 Church St. New York — 515 Laflin St. Chicago

Bay State Install

Equipping 1500 Cars Wit



ECONOMY Meters

This Energy-Checking Device

After an exhaustive study of car energy-checking devices the Bay State Street Railway has ordered Sangamo ECONOMY Watthour Meters for immediate installation on all its active cars.

This is one of the large properties of the country (look at the map). The lines serve many substantial manufacturing cities in Eastern Massachusetts and a very densely populated suburban interurban and summer-resort territory surrounding Boston.

The Bay State Management, in its energy-saving campaign, will meter the energy because *that's what it wants to save*—and car motor energy consumption is the correct relative measure of the motorman's efficiency.

The dial of the ECONOMY Meter shows the motorman just how much energy he uses.

He knows that by saving energy he saves money, and few men are wilfully wasteful.

Because the ECONOMY Meter measures what he is trying to save, the motorman can satisfy himself as to the most economical methods of operation. His interest is held and he does save.

These fundamentals underlie the success of the ECONOMY Meter.



"The Watchdog of Your Power"



Mailed on Request

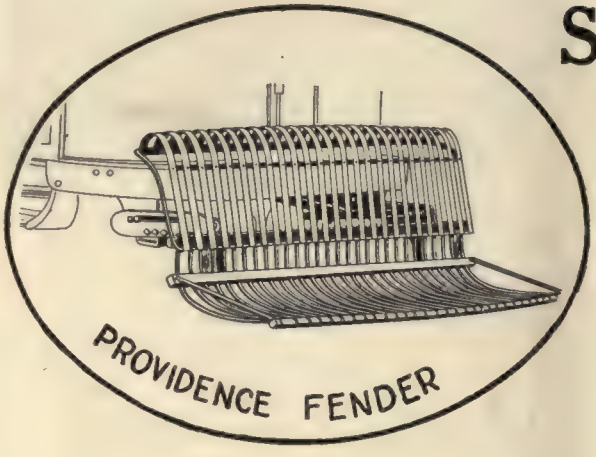
The ECONOMY Meter promotes more economical use of energy in car operation. It is easily installed by connecting in series with the car motors. It displays the car motor energy consumption on cyclometer dials like a fare register. These readings are the basis for checking the performance of motormen. Comparison of records induces sustained effort to excel.

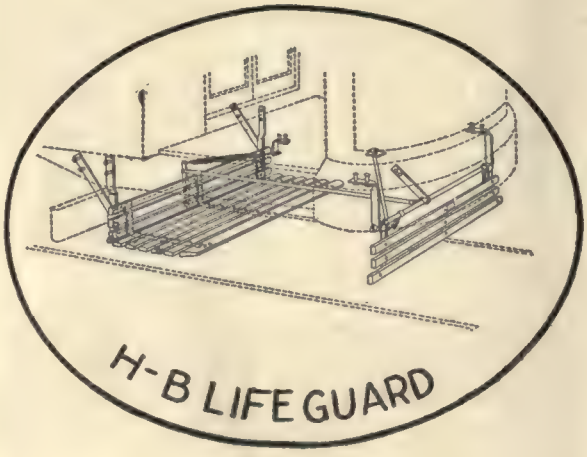
Thus energy is saved.



L. E. GOULD, President







Save Life and Limb Over Here

H. B. Life Guards are a safe protection against serious personal injury. They give a protection which is automatic, instantaneous and thoroughly dependable.

If you are equipped with H. B. Life Guards front end accidents are almost impossible.

The photograph above shows a street car equipped with H. B. Life Guards. In the background is the Capitol of Texas, at Austin.

The Consolidated Car Fender Co.
Providence, R. I.

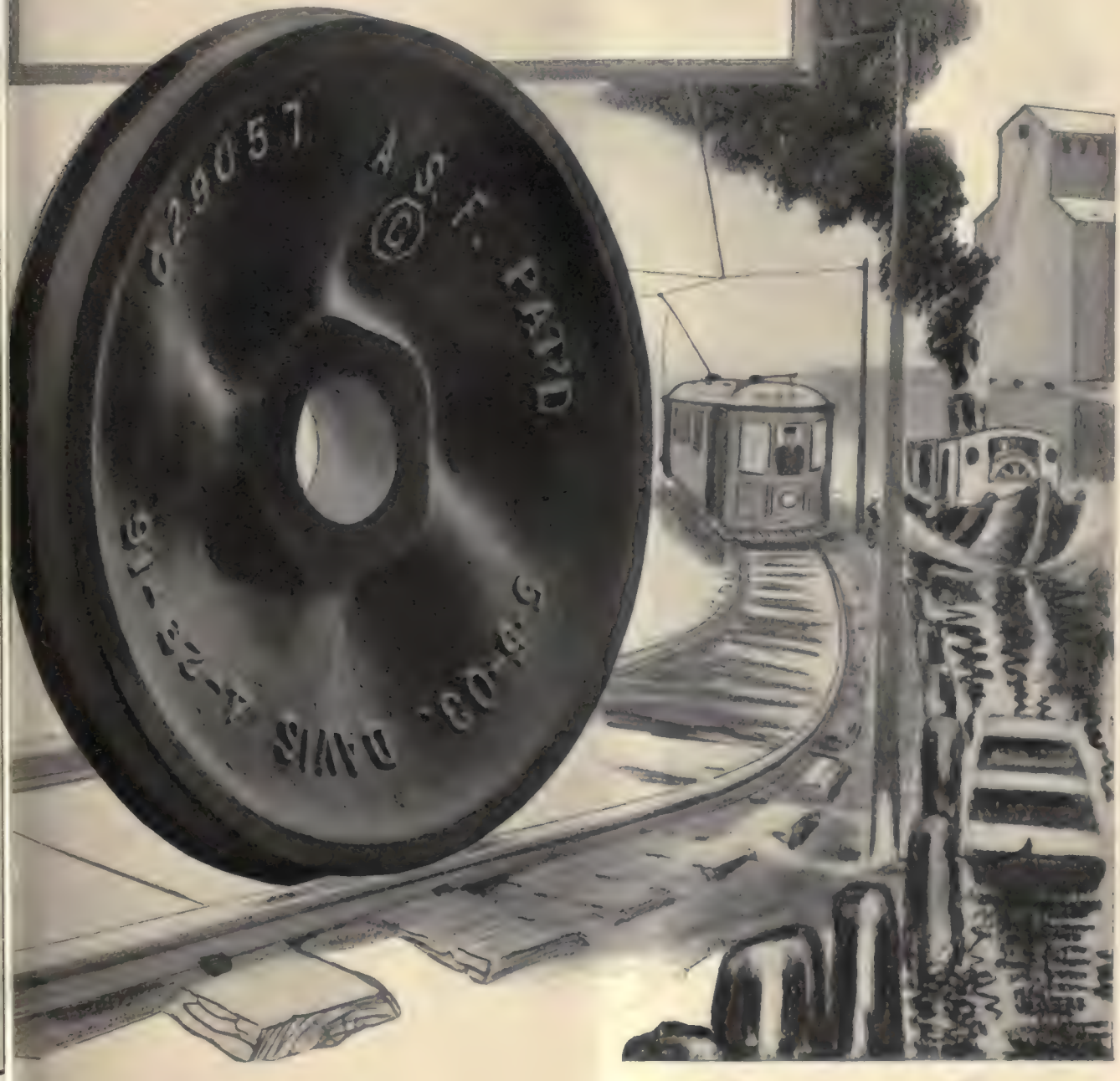
General Sales Agent
Wendell & MacDuffie Co.
61 Broadway, N. Y.

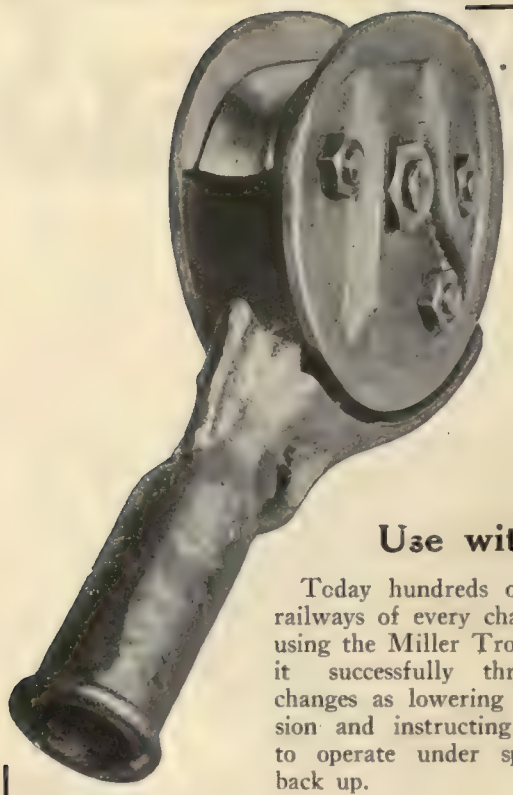
DAVIS STEEL WHEELS

Absolute Wheel Safety—

maintained on electric lines equipped with Davis Steel Wheels. At dangerous points and on the sharpest curves Davis Wheels have proved their reliability. The hard, tough manganese steel in the flange and tread is a wonderful safeguard. It effects a marked decrease in flange wear, one of the chief wheel troubles in electric railway service.

AMERICAN STEEL FOUNDRIES
1100 McCormick Building CHICAGO





The MILLER Trolley Shoe

The best and last word in current collection at minimum wheel and wire cost

Hardly a year has gone by since the Miller Trolley Shoe was placed on the market to demonstrate that the principle of sliding contact so successfully used abroad—and adopted in the pantograph form for the *heaviest* work in this country—could also be adapted for

Use with Existing Trolley Poles and Bases

Today hundreds of cars on scores of railways of every character of service are using the Miller Trolley Shoe—and using it successfully through making such changes as lowering the trolley base tension and instructing platform men how to operate under special work and to back up.

Wherever the principle of the Miller Trolley Shoe has been correctly applied and fairly followed up, the user reports a life far in excess of the trolley wheel and a wire-wear that is less than it would be with a higher tension contact that does not *hug the trolley wire as tenaciously as the Miller Trolley Shoe.*



Among the many important benefits of sliding contact obtained by means of the Miller Shoe are the following:

No smashing down of overhead and consequent breakage of trolley wire—

No arcing at spans or burning of trolley wire—

No limitation on the use of composition or steel contact wire trolley—

No bent trolley poles or bruised car roofs; and

NO TRAFFIC INTERRUPTIONS DUE TO DEWIREMENTS

Miller Trolley Shoe Co., West Newton, Mass.

SPECIAL REPRESENTATIVE: Holden & White, Inc., Chicago

SALES REPRESENTATIVES

Alfred Connor, Denver, Col.

T. C. White & Co., St. Louis, Mo.

S. I. Wailes, Los Angeles, Cal.

F. F. Bodler, San Francisco, Cal.

W. F. McKenney, Portland, Oregon.

W. M. McClintock, St. Paul, Minn.



he GREATEST MOTHER *in the* WORLD

Stretching forth her hands to all in need; to Jew or Gentile, black or white; knowing no favorite, yet favoring all.

Ready and eager to comfort at a time when comfort is most needed. Helping the little home that's crushed beneath an iron hand by showing mercy in a healthy, human way; rebuilding it, in fact, with stone on stone; replenishing empty bins and empty cupboards; bringing warmth to hearts and hearths too long neglected.

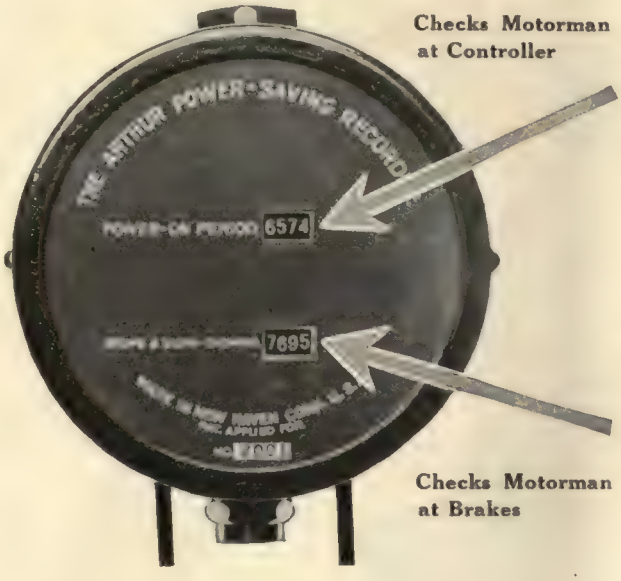
Seeing all things with a mother's sixth sense that's blind to jealousy and meanness; seeing men in their true light, as naughty children—snatching, biting, bitter—but with a hidden side that's quickest touched by mercy.

Reaching out her hands across the sea to No Man's Land; to cheer with warmer comforts thousands who must stand and wait in stenched and crawling holes and water-soaked entrenchments where cold and wet bite deeper, so they write, than Boche steel or lead.

She's warming thousands, feeding thousands, healing thousands from her store; the Greatest Mother in the World—the RED CROSS.

Every Dollar of a Red Cross War Fund goes to War Relief

s space contributed by the publishers of the Electric Railway Journal through the Division of Advertising, U. S. Gov't Comm. on Public Information



Mechanical Perfection *alone* can never produce the most efficient results in railroading

In every department of your property you may have the very best of equipment. In power plant, track, line, cars, everything may be of the very best and most approved design and quality. But if that equipment is not *properly used* there is bound to be loss and waste.

Maybe you have heard the story going the rounds about President Truesdale of the Lackawanna saying to an old engineer this winter: "Mike, why is it? We used to have just as hard winters as this—just as bad weather—but we used to get the trains in on time somehow and now we don't."

And Mike's reply was this: "Well, Mr. Truesdale, it seems to me, sorr, that in thim days we had cars of wood and men of steel, and now we have cars of steel and men of wood."

Maybe Mike was right and maybe he wasn't. But the point is clear just the same. It is the *human* element that counts most.

And that is where the value is shown of

The Arthur Power-Saving Recorder
It helps your men to cut your costs

Neither it nor any other device for a like purpose can cut your power costs by automatic action—by its own workings. But if you instruct your men *how* to run cars economically and *then* use the Arthur Recorder to record their care and skill you can get reduced power consumption, cut your costs for maintenance of equipment and get better, safer car operation.

These facts have been definitely proven.

The Arthur Power-Saving Recorder Co.
Second National Bank Building, New Haven, Conn.



For offenses scarce more heinous than the use of such a devil's trap as a gaudy sedan chair, English men and women of 1637 were banished, had their ears cut off or were hanged.

Even in 1687 the first horse coaches which appeared in Boston were severely frowned upon and their brazen owners were subjected to scorn and derision.

Demands for Better Transportation Overcome Superstitious Objections

In spite of the fact that they were looked on as doomed to eternal perdition, users of the first horse coaches in Boston continued to use this improved method to travel.

Their use spread, and finally horse-drawn carriages came into universal service.

The need for better transportation was so apparent and those who adopted the newer ways were so persistent in using them that the objections of the superstitious were overcome.

Less than 140 years after the date of the first Boston horse coaches a steam engine pulled a train into Philadelphia for the first time.

Then began the rapid development which has resulted in our modern railways with their tremendous loads, great speeds and long runs.

Galena Oils

and Galena Service have been among the accelerating factors in railway development.

Since 1869 the lubrication needs of the railways have been anticipated by the experts responsible for Galena Oils and Galena Service.

Now, as for the last half century, Galena experts are anticipating today the lubrication needs of tomorrow.

Galena-Signal Oil Co.

Franklin, Pa.

Maximum Strength and Toughness

"Electroheat"

Axles



A charge of "Electroheat" Car Axles entering the Electric Furnace for heat-treatment

STRENGTH and TOUGHNESS are fundamental requisites of a good axle steel. Without strength it cannot resist breakage through the application of a static load; and without toughness an axle is brittle and may break when subjected to a severe shock. In "ELECTROHEAT" Axles the minimum strength combined with proper toughness is assured. And by the electric furnace process of heat-treating absolute *uniformity* in production is possible, because positive automatic temperatur control removes all the uncertainties o old-time methods of heat-treating.

That's why "ELECTROHEAT" Axles mini mize service failures due to breakage bending and excessive journal wear The process of heat-treating is *metal lurgically right!*

NOTE:. "Electroheat" Armature Shafts possess the same torsional and shock resisting qualities as "Electroheat" Axles, being heat-treated by the same process. They minimize service breakdowns and maintenance costs.

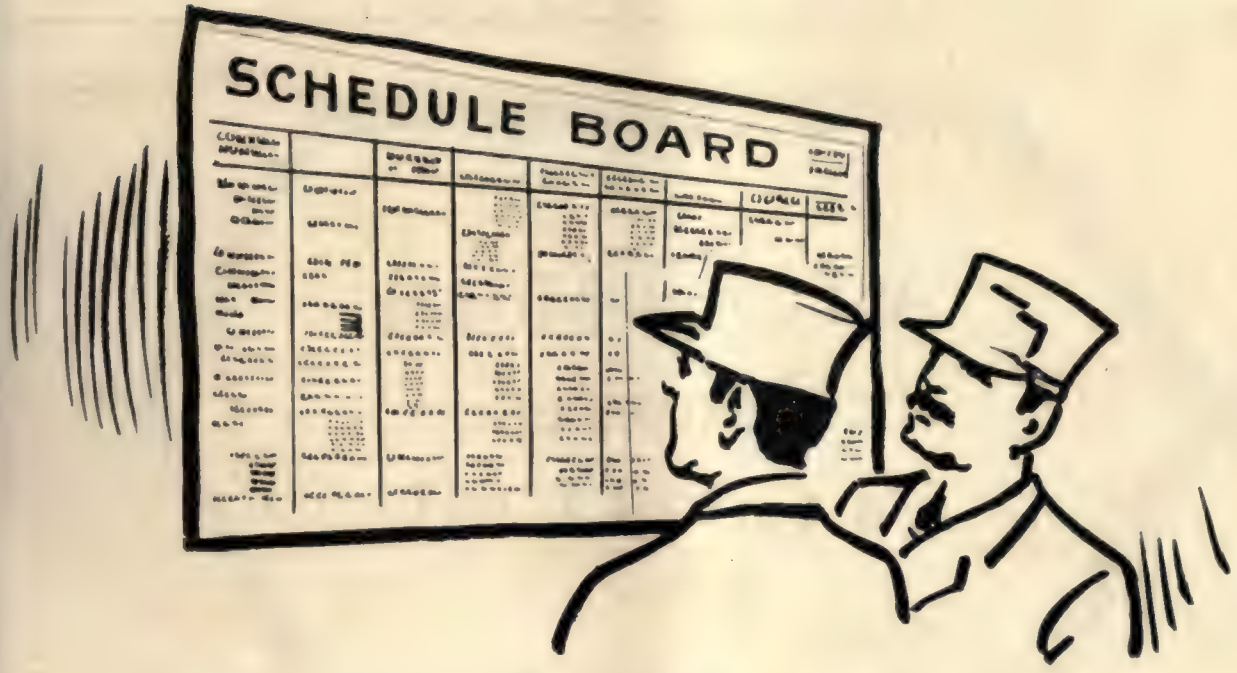
LOOK FOR VALSCO ON EVERY AXLE

"If Heat-Treated Electrically—It's a VALSCO"

LACLEDE STEEL COMPANY

General Offices—Federal Reserve Bank Building

Saint Louis, Mo., U. S. A.



Economical Schedules

can be obtained only by operating every car on the schedules according to the same standards of efficiency in acceleration, braking, COASTING and standing TIME.

By measuring the most important element—COASTING TIME—the

Rico Coasting Recorder



points the way to the grouping of cars according to their running time.

Time is the Essence of Railroading

RAILWAY IMPROVEMENT CO. RICO 61 BROADWAY, NEW YORK



A Good Motor Deserves a Good Coil

WHEN G-E Motors leave the factory they are 100% quality. To get the most from them they should be maintained in that condition. This can be done only by selecting G-E replacement supplies.

Take armature coils for an example. There are many substitutes but only one best—the one made in G-E shops by G-E men and from G-E quality material.

G-E Coils for replacement are built up from the same materials and by the same workmen as the original coils. They fit as well and last as long as those that went with the motors.

There's more to a coil than the cost.

General Electric Company

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chattanooga, Tenn.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Columbus, Ohio
*Dallas, Tex.
Dayton, Ohio
Denver, Colo.
Detroit, Mich.
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General Office: Schenectady, N.Y.

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Minneapolis, Minn.
Nashville, Tenn.
New Haven, Conn.
New Orleans, La.
New York, N. Y.
Niagara Falls, N. Y.
*Oklahoma City, Okla.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Providence, R. I.
Richmond, Va.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah
San Francisco, Cal
Schenectady, N. Y.
Seattle, Wash.
Spokane, Wash.
Springfield, Mass.
Syracuse, N. Y.
Toledo, Ohio
Washington, D. C.
Youngstown, Ohio

*Southwest General Electric Company. For Canadian business refer to Canadian General Electric Company, Ltd., Toronto, Ont. General Foreign Sales Offices, Schenectady, N. Y.; 120 Broadway, New York City; 83 Cannon St., London, E. C., England. 43-10

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 New York, Saturday, May 25, 1918 *Number* 21

Real Purchasing Agents Save Money

A MAN'S job is gaged by his character at least as much as by his title. That is why a purchasing agent may be either an order and tracer clerk or a real buyer. His job calls for something more than watching the lead pencil market and refusing perfectos from salesmen. He has duties which tend to infringe the purchasing prerogatives of every department head and consequently he must be able to show cause every time and show it diplomatically.

If he is a buyer and not a clerk he can do wonders in reducing the cost of maintenance, for, like the manager, he is interested in making the dollar go farthest regardless of departmental jealousies. To illustrate: One purchasing agent noticed that the car maintenance department was getting an extraordinary increase in wheel life. He knew that trolley wire costs more than trolley wheels in the long run. Hence he persuaded the management that a very hard wheel was the costliest after all, no matter how fine a showing it gave to the car maintenance department.

As this purchasing agent has real power, he does not wait to buy wire until the line department asks for it, but buys when the market is low. Conversely, he holds scrap copper until the market is high. Last year he played this bear and bull game so well that the net expense for new wire was almost nil.

Needless to add that, as a genuine purchasing agent, he is keen to buy on the basis of tested quality every time, and he believes that electric railways will never buy soundly as a class until the purchasing agents as a class have an association of their own to work out this and many other problems peculiar to their work.

Hand to Mouth Purchase Policy Under Existing Market Conditions

THE wise purchasing agent, even in normal times, knows the value of advance purchases of stocks of those commodities for which there is a practically constant demand. It would seem that in the face of all the troubles now encountered in securing materials, there would be no need for calling up the subject at this time. Nevertheless, if we are to judge by a letter from a leading supply man which we quoted in our "Manufactures and the Markets" column in our issue for March 23, it will be found that there are still many purchasers who, for one reason or another, persist in a hand to mouth method of securing their supplies.

Whatever the reasons for such a policy, it appears in general to be a mistaken one, more especially in war times when labor and material shortage, freight and express delays and embargoes all tend to prevent prompt shipment and delivery. The old saw about foresight being better than hindsight quite aptly applies to this situation.

With some materials, such as girder rails, no amount of foresight in the placing of orders seems to have stimulated the arrival of the materials into stores. In fact, we know of girder rail orders placed almost two years ago which remain unfilled.

Nevertheless the great variety of materials needed by the railways are not yet subject to such prolonged delays, and our correspondent stated that if needs were anticipated and orders placed a reasonable period in advance, the materials would generally arrive in the storeroom in time to meet requirements. This would mean not only reduction in annoyance and time but often considerable monetary saving, because rush shipments generally require the manufacturer to offer exorbitant wages to workmen and to ship by express, both of which create price increases which the purchaser must pay.

We believe the manufacturers of electric railway materials are doing their utmost to co-operate with the railways in these strenuous times, and it is no more than just that the railways should do their part by endeavoring to anticipate their purchase requirements to the fullest possible extent.

Haul Freight and Do Your Bit

THE financial tide has turned adversely for many electric railway enterprises, and the street and interurban railway managers are now compelled to abandon practices not absolutely necessary and keep on the alert for opportunities which will aid in advancing the earning power of their lines. The development of plans for handling freight in less than carload lots presents possibilities for electric lines to preserve their position and strengthen their resources. It is essential that they take advantage of the present opportunity to handle this class of business in conjunction with steam roads, thus helping to relieve the present congested condition of the freight service and at the same time add to their own income.

Many interurban roads are anxious to handle freight and express on their lines, but they have not the equipment or facilities for meeting the present congested conditions, and large increases in rolling stock or freight terminals are out of the question. A system of making freight deliveries direct to the consignee has much to commend it. Such a system would do away with much of the necessity for increased terminal sheds and would decrease the labor of handling. The best service would undoubtedly be obtained if such deliveries were handled entirely by the electric roads. With proper coöperation,

however, transfer companies could be of great assistance in relieving the congested conditions.

Electric railway systems cannot stand still, they must keep pace with the development and demands of the communities which they serve or they will be relegated to the scrap heap. The haulage of freight in less than carload lots is a work that can be conducted by most electric railways at much less cost and with greater speed than is possible by the use of motor trucks. Still in many cities definite routes are now being established for motor trucks to operate over and to provide the necessary service for shippers. This is a proposition that should receive careful consideration and thorough investigation, and it is a patriotic duty to our nation in a time when its future safety and development depend on transportation.

Will Automobile Competition Increase or Decrease?

IN THE heyday of its popularity, during the early nineties, the bicycle made big inroads into the receipts of electric railways of that time. So many people preferred to ride their wheels to work and home in the evening and took bicycle rides on holidays rather than trolley tours that the loss in patronage became a serious one for the railway owners. But the decrease in the popularity of the bicycle was almost as rapid as its rise. As a disturbing factor in electric railway affairs, it soon failed to have any material effect.

We do not anticipate so rapid a decline in the popularity of the automobile, the means of individual transportation which succeeded the bicycle. Nevertheless, present circumstances point to the advent of limiting conditions to its use.

The first of these is the condition brought about by the mere number of cars on the street. The most serious part of the congestion produced by them, however, is not from the cars in use, but those left by the owners next to the curb for hours at a time. An automobile on the street is wasteful enough of street area when it is moving. It is still more of an obstruction when "parked" by its owner while he is attending to business. Nevertheless, this is an evil with which many cities have to contend. We are glad to notice that our national capital, Washington, has just taken active steps to repress this nuisance. The direct purpose of the steps taken there is to reduce the interference by automobiles with the street cars. The latter, which are the means of transportation of the masses, have received priority of right-of-way.

The curtailment in the use of steel by the automobile manufacturers, recently ordered by the government, will cause a reduction for the present in number of cars manufactured, while the increasing demand for gasoline for war uses may cut down the consumption permitted by private cars. In such a case it is not at all unlikely that many persons will be driven again to use the cars just as they did when the bicycle fell from its high estate. An increase in the price of gasoline alone would probably not greatly decrease its consumption by pleasure cars. The cost of fuel is one of the smallest items of expense in the operation of an automobile, and if gasoline should go up even to double its present price the percentage increase in the total cost of automobile operation would be small. But the question is whether enough gasoline is being produced to supply our army and navy and yet permit the present enormous consumption by road vehicles. In such a case the government could well limit the use of both pleasure and commercial vehicles.

Women Conductors Can Give Satisfactory Service

SOON after the war broke out in August, 1914, many of the British tradesmen advertised that they would conduct "business as usual." They soon learned, and the country learned, that business could not be conducted as usual in war time. To combat the enemy successfully meant a tremendous strain upon the man power of the country, and women began to take up many of the duties formerly undertaken by men, including that of acting as conductors and even as drivers on electric cars. Now the use of women for this purpose is very common throughout Great Britain, Glasgow, for instance, with 862 cars having on June 1, 1917, 1514 women conductors and 203 women drivers. Women have also been employed extensively as conductors and drivers of electric cars in Italy and France with satisfactory results.

In this country up to the present women have been employed as conductors for surface cars, to any considerable extent, certainly, only in New York and Brooklyn, but in both of those cities they have been at work for a sufficient length of time that the practice can no longer be considered an experiment. It has been accepted by the public, and there has thus been opened to women a new line of work which is considerably more remunerative and no more arduous than many others in which they have been engaged in the past.

The first question which will naturally suggest itself in connection with this matter is whether the work is one which is suitable for women. On this point there are two recent reports, given in part elsewhere in this issue. While that by Mr. Squires is frankly critical, that by Dr. Bell of the New York State Industrial Commission explains that the work is less exacting and confining than that in many other occupations open to women. This fact is confirmed by the interviews contained in the State report, which is seemingly both thorough and constructive.

A second question is as to the effect on operating practice. Naturally, it is to complicate it somewhat. It means the providing at all carhouses of two sets of rest rooms instead of one and the duplication of other facilities, or, in other words, an expense which could be avoided with only one class of train employees.

Finally it would be well to consider the argument raised in the past in cities where applications have been made for permission to use women conductors, that if the companies offered wages high enough, they could get as many men as they needed. This may be true, but there are two answers to this. The first is that the companies cannot afford continually to raise wages, and the second is that if certain work can properly be performed by women, it should be done by them and the men released for work which only men can do. The testimony in New York as well as from abroad is that the work of a conductor can be performed by women without injury to their health or morals.

No Time for Municipal Counsel to Play to the Gallery

IT IS useless for municipal counsel to attempt to influence the judgment of regulating commissions by the introduction of prejudicial matter. As Harold L. Geisse, secretary Wisconsin Railroad Commission, recently said, "It is a method to be deplored, totally ineffective and unworthy of notice by opposing counsel."

From the commission's point of view, all of this is true. From the utility's point of view, the method is certainly deplorable, but it is not ineffective or unworthy of notice. To be sure, the intelligent part of the public, in following utility cases, is not moved by non-probative testimony brought out by shrewd city counsel. But that portion of the public which is controlled by its prejudices is profoundly stirred by mere innuendoes, unfulfilled promises of lurid disclosures and other tricks of the lawyer who tries to muddle the situation. These people should not be ignored, for some of their minds can be broadened by education. For the sake of this result, therefore, even intimations of untruths by municipal representatives should not be allowed to go unchallenged. No pitched battle with opposing counsel is either necessary or advisable; a dignified notice of misstatements or insinuations by a plain recital of facts is quite sufficient.

Sometimes, however, the commission itself is justified in raising a protest. This thought came to our mind as we recently sat through several weary hearings on the application of the Public Service Railway, Newark, N. J., for higher fares and listened to the municipal trial lawyer endeavor to create a prejudice against the company. We have no desire to attribute wrong motives to the municipal counsel, but some of his questions upon cross-examination of company officials speak for themselves.

These were his opening hints—"trailed by a company detective"; "more disclosures will follow." This was his puerile and silly question for the benefit of American Bolsheviki—will President McCarter give up some of his annual salary to meet the needed emergency revenue of $3,500,000? This was his appeal to prejudice against corporations—is not the fact that the company wants higher revenues in spite of municipal opposition a case of "the public be damned?" This was his most contemptible insinuation—were not the recent letters of President Wilson and Secretary McAdoo, urging fair play for utilities, "promoted" by a utility committee?

Such a lack of comprehension of and attention to the fundamental issues in the Public Service case is most deplorable. Nero fiddled while Rome was burning; Van Winkle daddles and slurs while the company faces an emergency. The railway does not deserve such treatment. With a phenomenal development in munitions plants, shipyards, government depots and cantonments through New Jersey, the railway's facilities are severely taxed, to say nothing of the burdens of higher operating costs. The company must have relief in order for it properly to perform its public function. Reasonable service for the public can only be had through reasonable prosperity for the utility.

If municipal attorneys cannot do more than merely play to the gallery of the non-thinking public, they should be sternly rebuked by the presiding commissioners. This has been done to some extent in the Public Service case, but not sufficiently. It would be well for all regulatory bodies to bear in mind Bacon's words: "There is due to the public a civil reprehension of advocates where there appeareth cunning counsel." Commissions have been organized not only to see that the public gets what it pays for and that the public pays for what it gets, but also, as Commissioner Whitney in New York recently said, to see that the policy pursued by commissions and *other public authorities* is such as to assure at all times the development and improvement of enterprises to meet the public need of utility service. Municipalities have a right to a fair hearing in rate cases, but that gives their counsel no license to use unfair methods of presentation, harmful to the general public. With commissions as with individuals, patience sometimes ceases to be a virtue.

Increase Mileage Production Per Car

WHEN production engineers survey conditions in a machine shop they give much thought to the methods used to bring the material to the machine—for the machine represents a big investment and demands high-speed production if it is to pay. An efficient shop will not allow a costly machine to stand idle for lack of transport devices to be used for bringing the "feeding-in" material.

To do likewise with a car, which, after all, is a tool for producing car-miles, we must take advantage of every means to accelerate the feeding-in of the passengers handled in order that the car may be filled and emptied to return for a new charge as quickly as possible. The more people it can carry away during a given period, the more efficient it will be. The so-called small car with speed-up practices and devices will carry more people in an hour than the big car without them.

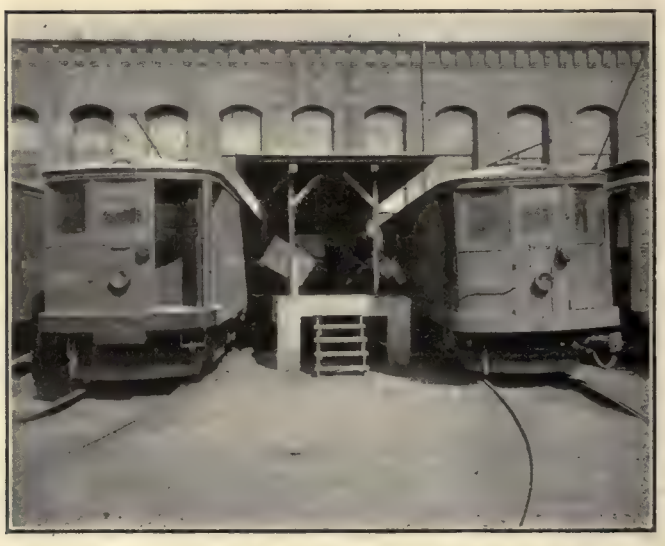
First in order is the prepayment area. We know how difficult it is to provide such areas in busy cities, but there are scores of large factories where the present terminals could be converted into prepayment stations at little cost. Perhaps, in some cases the factory would be willing to rent some frontage for the purpose of accommodating its employees as well as the railway. Many a present traffic snarl would be quickly disentangled by transferring to the ground the fare-collection interval which now cuts down the mileage output of the car.

Second is the loading platform in combination with the prepayment fare collection. This costs next to nothing, yet offers the advantage of saving about one-half of the time which a car requires to get away. Third is the possibility of pay-as-you-leave operation, particularly where single-end operation is used. Finally, we come to the use of car devices such as air-operated doors and steps, compact platform control with high rates of acceleration and braking, and motor-operated fare equipments—all of which contribute toward the goal of maximum mileage output.

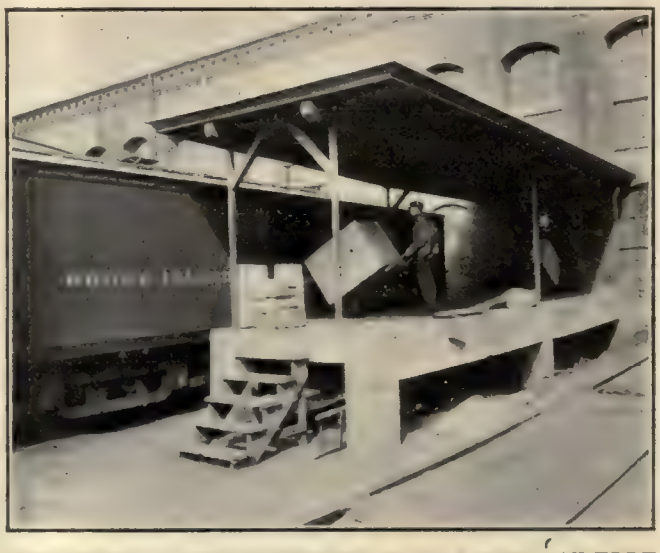
If electric railway men, therefore, will think of a car as a production engineer thinks of a machine tool, they will appreciate more than ever why it pays to spend an extra $1,000 on a $9,000 car if thereby the $9,000 investment can be made to give 10 to 20 per cent more output, which is miles and money.



TEAM SIDE OF RHODE ISLAND COMPANY'S FREIGHT HOUSE AT PROVIDENCE



UNLOADING PACKAGE FREIGHT AT PROVIDENCE, R. I., FREIGHT STATION



CONCRETE LOADING PLATFORM, 30 FT. X 10 FT., AT EDDY STREET FREIGHT HOUSE, PROVIDENCE, R. I.



EXPRESS CARS IN LOADING AND UNLOADING BERTHS AT EDDY STREET FREIGHT HOUSE

Rhode Island Electric Freight Business Increases 185 Per Cent in Ten Years

In This Article Attention Is Especially Directed to the Details of Less-than-Carload Freight Handling at Providence Where Cars Are Loaded and Unloaded on Stub-End Tracks

SINCE the publication of the article on the freight handling facilities and methods of the Rhode Island Company, in the issue of the ELECTRIC RAILWAY JOURNAL for March 29, 1913, page 573, the freight department of this company has greatly expanded in income and facilities. Physically the most conspicuous development has been the remodeling of the old power house on Eddy Street into an excellent freight house. While, of course, if the building had been erected new it would not have been given quite the same proportions, nevertheless it is well located and has been admirably arranged for the purpose of handling a large package freight business with minimum interference of car movement.

At present from ninety to 100 loaded cars are handled in and out of the Providence freight station daily, at times of peak load taxing the capacity of the terminal. A number of photographs are reproduced herewith to show the appearance of the station on a typical day, but not at time of peak load. The freight house is a substantial brick building, with steel and tile arched roof, about 277 ft. x 75 ft. in outside dimensions. It is divided by a brick partition into two parts of the sizes shown in the diagram on page 1005, the larger section being for incoming freight. At the street end of the building are two tiers of offices, the principal ones being on the second floor. A portion of the street end of of the basement is also utilized. The principal feature of interest in the building is the row of short loading and unloading platforms projecting 30 ft. from the track side of the building. These average 10 ft. in width and are of very substantial concrete slab construction with heavy square concrete piers. They are protected from the weather by projecting roofs, supported on iron pipe columns so placed as to interfere as little as possible with the movement of trucks. The platforms are tapered so as to give the necessary clearance for the end platforms of the cars. There are ten of the platforms, so that twenty cars can be accommodated at one time.

The freight house is almost entirely surrounded with a paved area, arranged for the purpose of encouraging the driving of teams in at one side and out at the other. It is somewhat difficult to accomplish this as the tendency is to enter and leave on the team side of the building, where, unfortunately, the area is not as great as would be desirable. By a process of education it is hoped to get the teamsters into the habit of making the complete circuit of the building.

A rather complicated special-work layout was necessary in connection with the stub-end arrangement of tracks, and this layout requires a considerable yard area. Experience with the operation of the house during the past two years, however, has convinced the management that the expenditure for trackwork has been well justified by the results, as it is possible for cars to go in and out without interference. The question of area did not enter seriously here as the building in its present position on the site was inherited by the freight department and there was ample space on one side for the selected type of special-work layout. Since the Rhode Island Company went into the freight business nearly eighteen years ago there has been a consistent and uniform growth averaging about $22,000 per year. Freight service is furnished over 400 miles of track through eighty community centers. The distribution of these, not to scale, is shown in one of the figures reproduced in this article. The freight-car mileage made last year was 385,000, which is approaching the figure of 1000 car-miles per mile of track. The freight income is $870 per mile of track.

The department has now in service thirty-four regular motor express cars, three electric locomotives, six box trailers which are used for miscellaneous freight such

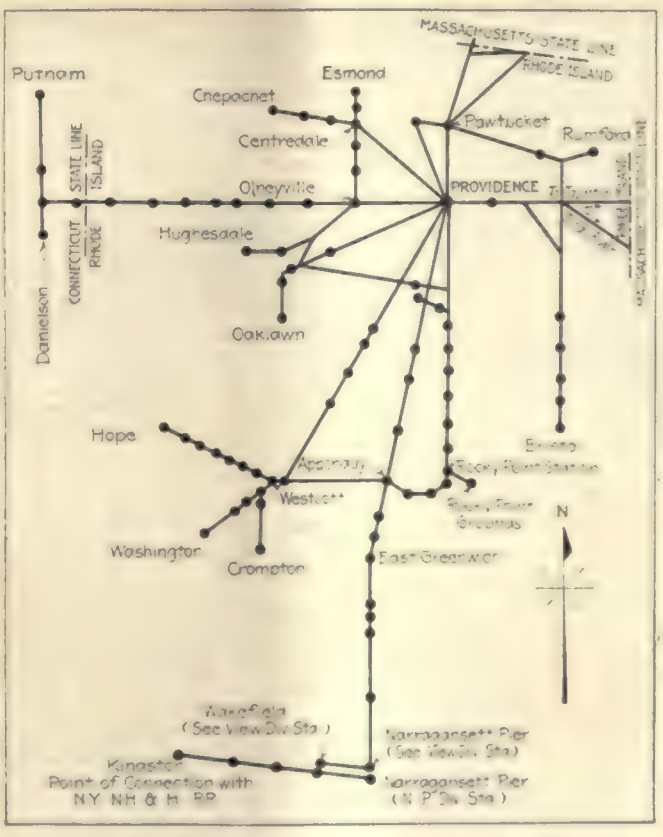


DIAGRAM OF FREIGHT CENTERS ON RHODE ISLAND COMPANY SYSTEM (NOT TO SCALE)

as lumber, nineteen small gondola cars, three wood hopper cars, five gondola coal cars and three 30-ton wood hopper coal cars (used on the Sea View division). As the coal business has fallen off considerably due to embargoes the coal cars are now being used principally for handling ashes from the power plants to fills. All of the express cars are motor cars except that a few trailers are used in outlying regions. The Rhode Island Company handles New Haven M. C. B. equipment on per diem rates, collect, but owns no M. C. B. interchange equipment itself. The company also interchanges cars with other lines, which it can do being under the jurisdiction of the Interstate Commerce Commission. Regular freight service is given between Boston and Providence, the cars coming and going by night. Two of the motor cars are furnished with M. C. B. couplers so that they can pick up steam road equipment if necessary.



BILLING ROOM IN EDDY STREET FREIGHT HOUSE, PROVIDENCE, R. I.

The billing of freight is done in the Eddy Street freight house at Providence, where a force of thirty-eight men and boys is employed. The main billing office is shown in one of the photographs, and the dimensions of all the rooms used by the billing department are given in one of the drawings. The billing work is in charge of a chief clerk and an assistant. In the billing office are one chief bill clerk, one rate clerk, nine billing clerks, one all-night billing clerk, one voucher clerk, one filing clerk, one expense account clerk and a messenger. In the over, short and damage room are four clerks for handling cases on local lines and two for foreign lines. In the accounting room are a chief accountant, seven clerks, and a ledger clerk. In the cashier's office there are two cashiers and three collectors.

The Egry system of billing is used for local lines and regular manifests are used on foreign lines. Both four and five-roll Egry machines are used. The four-roll machines furnish an original, a delivery voucher, a freight bill and a station way bill. Where an extra copy for the agent is desired, the fifth roll gives him a way bill.

The term "local lines" as used above applies where there are no agents to receive or deliver the freight. In the event that the deliveries are made by the con-



INCOMING FREIGHT HOUSE OF THE RHODE ISLAND COMPANY AT PROVIDENCE

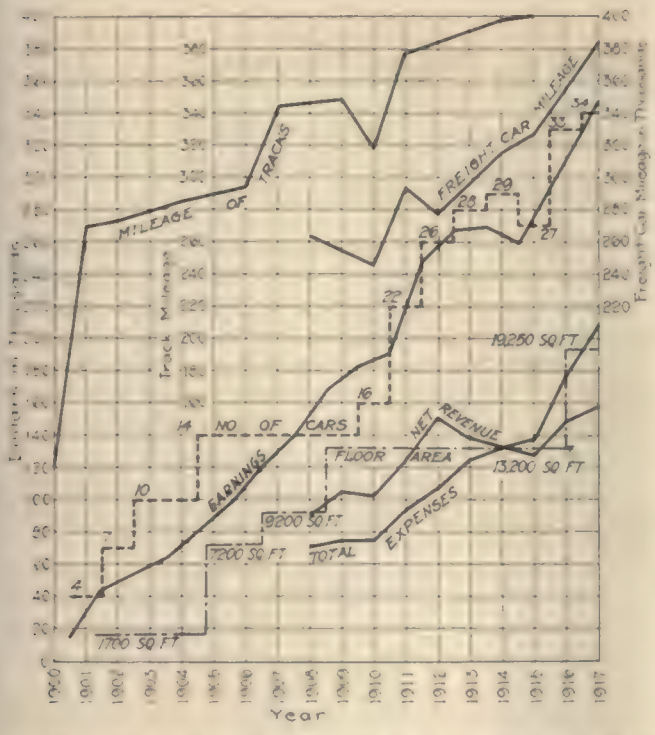


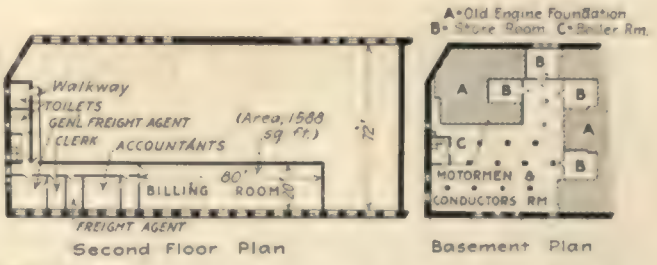
CHART OF FREIGHT DEPARTMENT OPERATING DATA, RHODE ISLAND COMPANY

ductor on the car along the line obviously this kind of service involves very careful checking to verify deliveries and to protect "shortages and overs." The Egry system provides the necessary safeguards. The term "foreign lines" applies where agents are located to receive and deliver the freight.

Records are preserved in the billing office for three years, and are then transferred to a less accessible point where they are stored for five years more.

The delivery records are kept in pasteboard boxes, and the car tallies, way bills and all other records except correspondence are filed in binders. In filing the tallies and other records a binding machine made by the McBee Binder Company, Athens, Ohio, is used. This permits the sheet to be bound permanently and inexpensively by a clerk entirely unfamiliar with bookbinding. The appearance of the bound records is very neat and they are readily accessible, as is seen in the photograph of the billing office.

A fair average month's business in the billing department on incoming freight runs about 14,000 pieces. The



SECOND FLOOR AND BASEMENT PLANS, EDDY STREET FREIGHT HOUSE

Egry billing on the local lines averages about 13,000 way bills per month. Twenty-four thousand pieces of manifest billing is an average month's work.

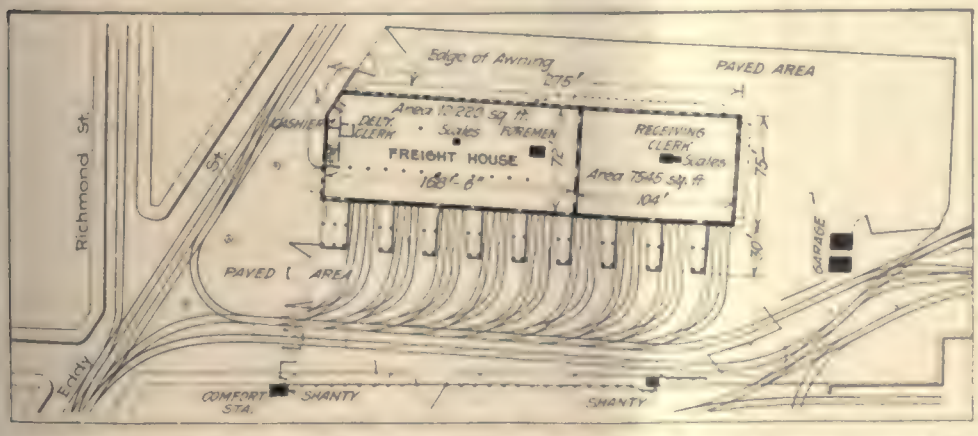
The billing office works in two shifts of nine hours each. The shifts are so arranged that one clerk reports at 2 p.m. and works until 11.30. The night clerk reports at 9.15 p.m. and is relieved by an early shift at 7.15 a.m. The office is open day and night except Sundays the year round, as is the freight house also.

FREIGHT DEPARTMENT IS ENTHUSIASTIC OVER ITS BUSINESS

A. E. Paddock, general freight agent the Rhode Island Company, is a firm believer in the future of the freight business for electric railways. He has had prepared the accompanying chart of data summarizing the growth of this department. He finds that the superior quality of service furnished by the electric lines is greatly appreciated by shippers. No time-table is published by the freight department, but the scheduled closing times for cars for different points are published each month in the *Street Railway Guide*, the official time-table booklet of the Rhode Island Company. All of the company's cars are "peddler" cars, picking up business along the line and hence furnishing a type of service that cannot be furnished in any other way.

Rush-Hour Shoppers Warned

At a recent meeting of the tramways committee of Cardiff, Wales, Arthur Ellis, general manager, asked the press to inform women intent on shopping and not engaged in war work that unless they could manage to do their buying in reasonable hours they would be excluded from the cars altogether. It might be necessary for women, said Mr. Ellis, to produce certificates to show that their business entitled them to ride in the cars. This was what it would come to if the cars were used for pleasure in busy hours. It was suggested that when their business was not urgent people should use the cars between 9.30 a. m. and 12.30 p. m., 3 p. m. to 4 p. m. and after 6.30 p. m. It was unanimously agreed that Mr. Ellis should have the power to curtail service whenever necessary, owing to the abnormal circumstances. Shoppers in America who travel during rush hours might well take warning.



EDDY STREET FREIGHT HOUSE, RHODE ISLAND COMPANY, PROVIDENCE, R. I., AND SURROUNDING YARDS

Women Conductors in New York

Labor Bureau's Report on Women Conductors—State Medical Inspector Makes Thorough Examination and Finds Conditions Generally Satisfactory—Employees Interviewed and Say Work Is Preferable to That in Which They Were Formerly Engaged—Federal Report Less Favorable

TWO reports on the woman conductors in New York have recently been made public. One of these is by Benjamin M. Squires, and is published in the May number of the United States Bureau of Labor statistics. The other was submitted by Rosalie Bell, M. D., medical inspector of the New York State Industrial Commission, to Hon. James L. Gernon, first deputy commissioner. Owing to the length of the Squires report and the fact that it is available in printed form, only a brief abstract is made of the portion relating to surface car conductors. In addition several pages of the report were devoted to the employment of women as subway guards in Brooklyn, but the conditions mentioned do not vary greatly from those described under surface car operation and as readers of this paper are more concerned with the references to surface cars in the report, the portion on subway practice has not been digested.

For the same reasons in the reports of Dr. Bell the portion relative to the women subway guards have been omitted. Otherwise, the reports by Dr. Bell are printed complete, except that initials have been substituted for the names of the conductors mentioned and their addresses have been omitted, to avoid annoyance to them.

When abstracts of the Squires report appeared in the New York papers, representatives of several papers interviewed Mr. Hedley, vice-president New York Railways Company, in regard to the report.

Mr. Hedley said that the work was easier and much more congenial than many kinds of employment which women left to work for the railway company, that they received an even more rigid physical examination than the men before they were employed, that there was every convenience for their health and comfort at the different stations, that they were able to get off one, two or three days to rest if necessary, that their pay was the same as the men received with the exception of certain bonuses for long service and that there were no complaints from the women.

He also called attention to the conclusions of the inspector of the State Industrial Commission.

The papers also carried interviews with several women conductors on both properties in which they expressed satisfaction with the work.

The photograph on page 1007 shows the new summer uniform adopted by the New York Railways. It is of khaki, like the winter uniform of the same company, but of better quality, and a skirt reaching to about 10 in. from the ground has been substituted for the former bloomers, the coat is shorter and laced leggings are used instead of the former tape puttees. The cost of this summer uniform is: Skirt and coat, $8; cap, $1; leggings, $1.

At the present time the New York Railways has 467 women conductors in active service and thirty students.

TABLE I.—TIME OF OCCURRENCE AND DURATION OF PERIODS IN THE DAY'S WORK OF WOMEN EMPLOYEES DURING A PERIOD OF SEVEN DAYS—NEW YORK RAILWAYS

Time of Occurrence of Waiting Period (Time Off Duty between Parts of Day's Work)	Number of Work Days, with a Waiting Period (Time Off Duty between Parts of Day's Work) of—									
	Under 1 Hr.	1 and Under 2 Hrs.	2 and Under 3 Hrs.	3 and Under 4 Hrs.	4 and Under 5 Hrs.	5 and Under 6 Hrs.	6 and Under 7 Hrs.	7 and Under 8 Hrs.	8 and Under 9 Hrs.	Total
7 a.m. and before 8 a.m.	1	...	1	...	1	..	..	..	..	3
8 a.m. and before 9 a.m.	2	12	18	38	25	..	1	8	7	111
9 a.m. and before 10 a.m.	19	43	73	56	19	3	15	29	4	261
10 a.m. and before 11 a.m.	2	22	30	6	2	6	6	3	..	77
11 a.m. and before 12 m.	4	43	44	7	1	1	1	2	..	103
12 m. and before 1 p.m.	12	84	120	26	10	1	..	..	..	253
1 p.m. and before 2 p.m.	7	102	75	24	2	..	..	..	..	210
2 p.m. and before 3 p.m.	23	90	188	37	8	..	..	..	..	346
3 p.m. and before 4 p.m.	14	196	165	44	3	..	..	..	..	422
4 p.m. and before 5 p.m.	25	155	86	8	1	..	..	..	..	275
5 p.m. and before 6 p.m.	18	50	7	4	1	..	..	..	..	80
6 p.m. and before 7 p.m.	6	25	6	...	1	..	..	..	..	38
7 p.m. and before 8 p.m.	5	10	2	...	..	..	..	..	..	17
8 p.m. and before 9 p.m.	2	3	2	...	..	..	..	..	..	7
9 p.m. and before 10 p.m.	1	1	3	...	3	..	..	..	..	8
10 p.m. and before 11 p.m.	1	1	5	2	..	..	..	..	..	9
11 p.m. and before 12 p.m.	...	22	16	...	..	..	..	..	..	38
12 p.m. and before 1 a.m.	5	13	...	...	..	..	..	..	..	18
1 a.m. and before 2 a.m.	2	1	1	...	..	..	..	..	..	4
2 a.m. and before 3 a.m.	...	...	1	2	..	..	..	..	..	3
Total	149	873	843	254	77	11	23	42	11	2,283

Report by Mr. Squires

A brief reference was made in the May 11 issue of this paper to the report by Benjamin M. Squires in the monthly review for May of the United States Bureau of Labor Statistics on street railway employees. The full text of the report, since available, shows that it occupies twenty-two pages of the review and contains a number of tables. It is devoted entirely to conditions in New York and Brooklyn where women are employed as electric railway conductors. The subject has been treated under four heads, though not so subdivided. These are: (1) statistical; (2) working hours and elapsed time; (3) period during day employed, and (4) sanitary and health conditions.

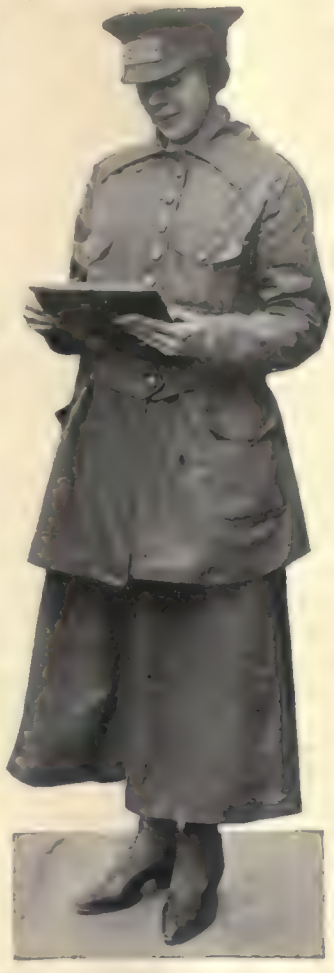
Statistical and Operating Data

According to the report women have been employed as conductors in the operation of surface cars in New York and Brooklyn since December, 1917, and on subway cars in Brooklyn since October, 1917. The Hudson & Manhattan Railway employs a number of women guards on its subway trains as well as women porters and ticket agents at the stations, and the Second Avenue and Queens Surface Lines have recently placed women conductors on their cars. The report is confined, however, to the practice of the New York Railways Company and the Brooklyn Rapid Transit Company.

On Feb. 15, 1918, the New York Railways Company had in its employ 452 women conductors, not including thirty-five students, or approximately 30 per cent of all conductors employed. The Brooklyn Rapid Transit Company on the same date had 138 women conductors, not including forty-one students, on its surface cars,

and 297 women guards, not including women employed regularly in other occupations who work a portion of their time as guards. These were 5.6 and 21.7 per cent respectively of the total number of conductors and guards employed. In addition, on its subway-elevated stations, the Brooklyn company employed 929 women ticket agents out of a total of 1002 in this occupation, and fifty women porters out of a total of 180. The use of women ticket agents is not an innovation, however, and the porters are virtually cleaners about the stations, and in neither position does the employment of women present any unusual difficulties.

After explaining that under the practice of both companies choice of runs goes with seniority of service, the report says that on Feb. 15, 1918, practically all of the 138 women conductors on the surface lines of the Brooklyn Rapid Transit Company were extras. Of the 297 women employed as guards and conductors on the subway lines with the same company, forty were extras. Of the 452 women conductors employed by the New York Railways Company, 119 were extras. All of the male conductors employed by the New York Railways Company had regular runs. Several tables are given to show the hours worked by women on straight runs, swing runs of two periods and swing runs with three periods during the twenty-four, with the length of time worked and the time elapsed.



Summer Uniform for Women Conductors
New York Railways

On the basis of one week, on the New York Railways, 13½ per cent of the total days worked by women conductors was completed in ten hours, and 62.9 per cent required twelve hours and over. On the Brooklyn Rapid Transit Company surface lines 16.1 per cent of the total days worked by women conductors required less than ten hours and 48.5 per cent required twelve hours and over. On the subway-elevated lines in Brooklyn, 36.5 per cent of the total days worked by women guards and conductors required less than ten hours within which to complete the day's work, and 50 per cent required twelve hours and over.

Table I, taken from the report, shows the duration and hour of occurrence of the waiting time of women employees during a period of seven days on the New York Railways Company. Similar tables were published for the Brooklyn Rapid Transit surface and subway-elevated lines.

Table II, also from the report, is a summary of the hours at which the runs began and ended on the New York Railways.

The author of the report thinks that those who advocate the employment of women as conductors have given scant consideration to irregularity of hours, to "within" time and to night work, or else they regard these as more than compensated by the comparative lightness of the work. The report considers the work not light, however, and that it involves considerable nervous strain as well as exposure to cold, damp and drafts, even on the best types of inclosed vestibule and center-door cars.

The report says "obviously a separate waiting and rest room must be provided for women employees. It must be considered too that since the strain upon women is greater than upon men in this work, opportunity for rest and relaxation must be provided in greater measure than for men. The need of adequate rest-room facilities for all women off duty becomes more apparent when it is taken into consideration that employees often live too far from the carhouses to make it practicable for them to go home between portions of the day's work. The immediate neighborhood of the carhouses is seldom inviting. Even if the waiting period comes at a convenient time or is of sufficient duration to permit women employees to shop or to go to places of amusement, it is

TABLE II.—NUMBER OF WORKDAYS OF WOMAN EMPLOYEES WHICH BEGAN AND ENDED AT EACH CLASSIFIED TIME DURING A PERIOD OF SEVEN DAYS—NEW YORK RAILWAYS

Beginning Time	Number with Ending Time—A.M.												Number with Ending Time—P.M.												Total
	12 and before 1	1 and before 2	2 and before 3	3 and before 4	4 and before 5	5 and before 6	6 and before 7	7 and before 8	8 and before 9	9 and before 10	10 and before 11	11 and before 12	12 and before 1	1 and before 2	2 and before 3	3 and before 4	4 and before 5	5 and before 6	6 and before 7	7 and before 8	8 and before 9	9 and before 10	10 and before 11	11 and before 12	
2 and before 3 a.m.	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
4 and before 5 a.m.	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	1	..	..	1	..	..	..	..	4
5 and before 6 a.m.	..	..	..	..	..	..	[1]2	1	3	3	..	2	..	..	1	1	5	33	36	98	3	..	..	1	189
6 and before 7 a.m.	..	..	..	..	..	..	..	..	12	11	6	7	..	2	2	6	12	27	214	217	89	4	..	..	609
7 and before 8 a.m.	2	1	..	..	..	..	..	..	..	1	1	..	2	..	1	2	1	3	30	88	40	13	..	1	186
8 and before 9 a.m.	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	1	1	8	18	2	..	..	33
9 and before 10 a.m.	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	7	..	3	1	..	15
10 and before 11 a.m.	9	1	..	..	..	1	..	..	..	..	..	1	2	..	1	..	..	3	3	6	2	1	5	16	51
11 and before 12 m.	59	24	5	1	..	..	..	..	..	..	..	..	..	1	..	2	2	1	3	3	2	2	8	24	137
12 m. and before 1 p.m.	147	173	43	3	..	..	..	..	..	..	..	..	..	..	3	8	1	4	5	8	7	9	6	33	450
1 and before 2 p.m.	51	128	38	3	..	..	..	..	..	..	..	..	..	..	..	2	2	6	2	5	5	5	2	14	263
2 and before 3 p.m.	8	19	2	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	4	1	1	3	1	3	44
3 and before 4 p.m.	4	5	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	1	3	1	1	1	24
4 and before 5 p.m.	4	7	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	2	..	1	..	19
5 and before 6 p.m.	2	5	..	..	..	5	3	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	18
6 and before 7 p.m.	2	2	2	..	..	8	5	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	3	26
7 and before 8 p.m.	1	5	..	..	..	5	12	5	6	2	..	..	..	..	..	..	..	..	..	..	..	..	1	1	38
8 and before 9 p.m.	..	..	..	..	..	..	1	1	6	6	..	..	..	..	..	..	..	..	..	..	..	..	..	1	15
9 and before 10 p.m.	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
12 and before 1 a.m.	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Total...	290	370	93	7	..	20	25	12	27	24	9	12	5	4	8	22	25	79	305	447	172	44	26	101	2,128

[1]Work ended the morning of the following day.

necessary for them to change to street dress and again to uniform or work dress." An inspection was made of the condition of the rest rooms in each depot and the facilities at some were criticised as inadequate. The report also speaks of the importance of maintaining near the car depots clean, wholesome lunch rooms as a means of maintaining the health and efficiency of the employees, especially the women employees.

Other Conditions of Employment

The uniform on the New York Railways is a regulation uniform consisting of an all-wool shirt, a coat, trousers, puttees and a cap of khaki. The company furnishes these at a cost of $5.75 to the employees. The women provide their own heavy coats and other apparel. Uniforms in Brooklyn consist of a dark skirt furnished by the employee, a cap and heavy coat, both dark blue in color, at a total cost to the employee of $16.10.

The age limits are twenty-one to forty-five, and a large percentage of the applicants are rejected. The same wages are paid to the women as to the men for the same work. The wages on the New York Railways and the surface lines of the Brooklyn Rapid Transit Company are 27 cents per hour for the first year. These wages increase on both lines to 30 cents for the second year and then by different gradations up to the sixteenth year, when the amount is 34 cents on the New York Railways and 35 cents on the surface lines of the Brooklyn Rapid Transit Company.

In discussing the attitude of the general public toward the practice the report says: "Public sentiment is rarely manifested except when inconvenience is threatened or occasioned. To those who use the street cars the introduction of women meant the operation of a greater number of cars and consequently better transit facilities. Attracted at first by the novelty of women conductors and inclined somewhat sentimentally toward the idea of women doing their 'bit' and releasing men for service, the general public seems now to have complacently accepted the situation with little thought of the consequences that may result and with less knowledge of the conditions under which women conductors work. A woman conductor, although still an object of interest, no longer excites any considerable comment."

The attitude of the Consumers' League of New York, as expressed by its representatives, is that there is no objection to women being employed in the operation of street cars but there should be protective legislation regulating the conditions under which women work. The Lockwood bill introduced into the Legislature at the recent session and indorsed by the Women's Trade Union League, New York State Child Labor Committee, and Consumers' League limits the work to six days or forty-eight hours in any week and to eight hours in any day unless for the purpose of making a shorter work day of some one day in the week, or before 7 o'clock in the morning or after 10 o'clock in the evening of any day.

The report concluded with the statement that from the facts brought out "it must be evident to every thinking person that it is practically impossible to make the conditions of employment even tolerably endurable to women employees." It also deprecates any policy of employing women to lower wages or to keep wages from rising to meet increases in the cost of living.

Reports by Medical Inspector of State Industrial Commission

REPORT ON BROOKLYN SURFACE LINES

Feb. 27, 1918.

Mr. James L. Gernon,
First Deputy Commissioner,
State Industrial Commission.

Dear Sir:

In accordance with your request, I have made an investigation of the complaints made by the Central Federated Union of New York and the Central Labor Union of Brooklyn and Queens regarding the employment of women on the "elevated, trolley and subways."

The New York Railways (Theodore Shonts, president), operates numerous lines of surface cars in the Borough of Manhattan. It employs women as conductors.

The Brooklyn Rapid Transit (T. S. Williams, president), operates surface and elevated railways and subway; the latter extends from Coney Island, Sea Beach, Bay Ridge, Brooklyn, to Times Square, Manhattan.

The first investigation made was that of the Brooklyn Rapid Transit, which employs about 1621 women as follows:

Ticket agents (about)	1,060	(employed on elevated and subway stations)
Conductors	210	(employed on surface cars)
Guards	324	(employed on surface cars)
Car cleaners	41	(employed at subway stations)
Porters	46	(employed at subway stations)
	1,621	

Their employment office is located at 40 State Street under the management of Albert Maxwell, superintendent of employment. Male applicants apply for positions during the morning hours; female applicants from 2 p. m. to 5 p. m.

Method of Applying for Position

All applicants are interviewed and casually inspected by Mr. Maxwell and his assistant, Mr. Hamilton.

If the applicant desires the position of conductor, she must be at least 21 years of age and measure 5 ft. 5 in. in height. Should the applicant fill these requirements, she is requested to write her name upon a blank card and present same to the physician and submit to an examination of her sight (distance and color), hearing, and answer numerous questions regarding her present and former state of health. If after the examination the applicant is recommended, she is required to fill out an application blank, is measured and weighed and the results are duly recorded upon the application blank. (Forms of these blanks are herewith attached.)

The applicant is then requested to sit for her photograph. Two forms are obtained—full face and profile. One of each is filed at the employment office, another at the station to which the conductor is detailed.

Later, she is given a badge and puncher for which she deposits $2, which is later refunded. She also obtains a cap and overcoat and is notified to appear at the School of Instruction, Fifty-eighth Street and Second Avenue, for instructions in her duties as conductor. (Guards are instructed at the subway station, Thirty-sixth Street and Ninth Avenue).

The school for instruction is located at Fifty-eighth

Street and Second Avenue, under the supervision of Mr. Winfield.

The instruction is theoretical and practical. A class room is fitted up with desks, blackboards, etc., and lectures are given to both men and women conductors on the methods of filling out day cards, recording the number of trips, transfers, etc. Examples in fundamental arithmetic are given to test the ability of the newly-appointed conductors.

A couple of days later the practical instruction is given. In the outer hall models of different types of cars are installed, and on these the conductors receive instructions relative to stopping car, opening and shutting doors of cars, signaling motorman, ringing up fares and transfers, etc.

The entire course requires about three days. When the conductors have given satisfaction in both departments, they are sent out on cars with experienced conductors for about four or five days. Then they return to the school, take an examination, which if passed successfully entitles them to a regular appointment. The salary begins from that date. The conductors are then detailed to one of the numerous depots.

The five car depots of the company at which women are employed are as follows: Fresh Pond, Twentieth Street and Ninth Avenue, Bergen Street and Troy Avenue, Flatbush, and Fifty-eighth Street and Second Avenue.

Fresh Pond Depot

This depot is in charge of a depot master. The female conductors detailed to this depot number forty-seven fully qualified and fourteen partially qualified. They serve on the following lines: Gates Avenue, Myrtle Avenue, Union Avenue, Bushwick Avenue, Wyckoff Avenue, Richmond Hill, Williamsburg Bridge local and Metropolitan.

The rest room for the women is located in a separate building, about 30 ft. x 12 ft. It is ventilated by two windows, lighted by electricity and heated by a large base-burner stove. It contains twenty-eight metal lockers, and there are numerous hooks around the walls. It has wicker lounge, numerous chairs and a telephone connected with the office whereby the conductors are notified when to start out on their cars.

Along one side of the wall is a long table divided into about twelve compartments and lined with metal. This is called a change-making table and is used by the conductors when making up their accounts after each run.

The wash room is adjoining. Two bowls and a wash basin have been installed but are not yet ready for use. The women conductors are obliged to use temporarily the toilets on the elevated station near by. The rest room was clean, well heated and ventilated. Several conductors were at leisure and resting during their "swings."

Their uniform consists of a heavy dark blue coat, a blue woolen shirt and a cap and ordinary shoes.

I interviewed two of the conductors whose swings did not expire for several hours.

1. F. N., twenty-three years of age, formerly employed by Loose-Wiles Biscuit Company as labeller. Piece work averaged about $12 to $13 a week. Has been employed as conductor for about three weeks. She is tall, well developed, has a fine color and says the work is not difficult. She made her application in the manner described, received a week's training and was appointed. She has never worked ten consecutive hours.

2. M. R., about twenty-two years of age, formerly employed by the Remington Arms Company, Bridgeport, Conn. Piece work averaged $3.50 to $4 per day, but work was not steady. Has been here for several weeks. Her hours are from 8 p. m. to 10 a. m. with swings between. Does not work ten hours per day. She looks fairly well and says her health has improved.

Twentieth Street and Ninth Avenue Depot

This depot is in charge of a depot master. The female conductors detailed to this depot consist of thirty fully qualified and six partially qualified.

They serve on the following lines: Sixteenth Avenue, Vanderbilt Avenue, Union Street, Flatbush and Seventh Avenue, Seventh Avenue, Smith Street and Fifteenth Street.

The rest room is in course of construction. Conductors occupy temporary quarters in another room which is clean and comfortable. The toilet facilities are adequate. I interviewed two conductors.

1. H. M., twenty-two years of age. Formerly employed as clerk in National Suit & Cloak Company and received $9 per week. Has been employed here for the past three weeks and claims to have gained 8 lb. She appears to be in excellent health.

2. Mrs. M. D., twenty-one years of age. Has a child seven months old. Before marriage worked in silk braid factory and made from $1.50 to $2 per day. Has worked here five weeks. At first the constant standing made her feet ache and swell, but those conditions have disappeared. At present she has a sore throat and has been treated by the association's physician, who has forbidden her to work for two days. I was informed that any employee who has been ill twenty-four hours must report to the association's physician, undergo an examination and not return to work until he permits it. Mrs. D. claims to have gained 5 lb. in the last five weeks. She appeared to be in good condition.

Bergen Street Depot

This depot is in charge of a depot master. The female conductors detailed to this depot consist of twenty-seven fully qualified and five partially qualified.

They serve on the following lines: Bergen Street, Summer Avenue, Tompkins Avenue, Lorimer Street, St. John's Place and Hoyt and Sackett Streets.

The rest room is located in a store on the opposite side of the street. It is about 30 ft. x 20 ft. x 10 ft., is ventilated by two windows, lighted by gas and heated by base-burner stove. It is furnished with lounge and numerous chairs. In the rear a portion is partitioned off and is used as a lunch room. It contains table and chairs and lockers. There is a matron in attendance, who at the time of my visit was serving lunch to several women conductors. The change-making table was in course of installment. I interviewed two conductors.

1. P. M., about twenty-two years of age, formerly employed as weaver in the American Rattan Company. Piece work averaged $12 to $12.50 per week. Employed here for about one month. She is accustomed to standing and does not mind it. She has not gained or lost weight, and appears to be in robust health.

2. S. B., about twenty-four years of age, formerly worked on a farm at Riverhead, L. I. Is a farmer's daughter. Has been employed two weeks and prefers this work to farm work. She is in robust health.

I also interviewed another young woman whose car left in a few minutes, so I was unable to obtain a full account of her work. She told me, however, that she preferred night work, as she did not go on duty until noon and that gave her a chance to sleep late in the morning.

The toilet here is located in the hall and at date of

visit was out of order. The women conductors use the toilets in the main building on the opposite side of the street, intended for the office employees.

FLATBUSH DEPOT

This depot is in charge of depot master. The female conductors detailed to this department consist of thirty-four fully qualified and three partially qualified. They serve on the Nostrand Avenue, Flatbush Avenue, Ocean Avenue, Rogers Avenue and Avenue C lines.

The rest room is located upstairs. It is a large, airy room about 40 ft. x 30 ft. x 12 ft., lighted by three windows. It contained twenty-four lockers, a change-making table, a lounge and numerous chairs. The toilet room with two bowls and two wash basins is located across the hall, all clean and sanitary. I interviewed two conductors.

1. A. O., twenty-two years of age. Formerly employed as a domestic. Has been employed here since Jan. 1. She finds the work easy and prefers to work during the day from 6.38 a.m. to 7 p.m., with intervening "swings." Her run requires about one hour.

2. O. D., twenty-two years of age. Formerly employed as saleswoman in Wanamaker's, where she received $12 per week. She is accustomed to standing and enjoys her work. She was most enthusiastic and said all the women were kindly and considerately treated by the Brooklyn Rapid Transit people from the highest to the lowest.

This completes the inspection of the depots, and the conductors detailed to surface cars.

I interviewed many whose "swings" expired shortly, and who, therefore were unable to give me a detailed account of their work.

Many preferred to work from noon or early afternoon to midnight and later with intervening swings, as this allowed them to sleep late in the morning. Others preferred the early morning hours, which enabled them to have their evenings free. Efforts have been made to detail a conductor as near her place of residence as possible. Some conductors preferred to serve on the "open-in-the-center" cars; others on the rear platform cars. In all types of cars, the muscular effort is slight.

When visiting the school of instruction, Fifty-eighth Street and Second Avenue, I tried each form of car myself. Personally I thought the "open-in-the-center" car the easiest, as all operations—opening and shutting doors, receiving fares and transfers, etc.—were performed by merely pushing a button.

In the rear platform cars, these same operations required pulling various cords. Leather handles, I noticed, have been attached to these cords, thus requiring a shorter reach for the conductor. This type of car is decidedly the most popular, as the women claim they obtain more exercise and are not obliged to stand constantly in the same space.

HEALTH OF WOMEN EMPLOYEES

The Brooklyn Rapid Transit Company has employed women as conductors, guards, car cleaners and porters since about Dec. 11, 1917. At the headquarters, I was informed that there have been but a few cases of illness among the female employees and no cases of pneumonia at all. The employees who have resigned have done so on account of the work interfering with their home duties and obligations or the objections raised by their relatives. Many who passed the different tests and were accepted failed to appear at the school of instruction and the matter was dropped. Ticket agents on duty at the elevated roads have been so employed for the last twenty years or more, so I did not make any investigations of their condition. Those at the subway stations are more recent. It is absolutely impossible for any person to state definitely whether or not the work is injurious to the "health and moral fiber" of women. Time alone will show. As far as I was able to observe, the women were in good physical condition, lively, interested and enthusiastic over their work.

Of course, only women in good physical condition are accepted by the physician. All the conductors are women whose former positions were less remunerative. Many were employed in factories and stores where constant standing was required without the fresh air they now enjoy as conductors.

It is but natural to conclude that, with the increasing salary, which permits better food and living quarters and freedom from financial worries, in addition to the fresh air, their physical condition will improve rather than deteriorate.

Through the courtesy of the examining physician of the Brooklyn Rapid Transit, I was permitted to select an applicant for the position of conductor who appeared in perfect physical condition and make a physical examination. The applicant will receive her appointment in a few days. I have permission to visit the station where she is detailed and make another examination in two weeks, to compare the results and thereby ascertain whether or not her health has improved or deteriorated.

As far as I could ascertain all applicants for position have been politely and courteously treated by the Brooklyn Rapid Transit Company.

Mr. Dempsey, vice-president of the company, very kindly gave Mr. Whitney and myself a letter requesting all employees to allow us to make any investigation necessary, also to answer any questions we might ask. He also requested me to inform him of any conditions which I considered undesirable. I complied with his request.

I make the following recommendations:

1. Regulate the hours of the employees that all may have one day of rest in seven.

2. Regulate the length of runs, making one hour and thirty minutes the maximum length of time between car depots or toilet facilities.

3. Complete the construction of the rest rooms and install a matron in each.

4. Provide heat in booths of ticket agents and boxes of coin agents.

5. Prohibit dry sweeping of subway.

6. Remove pools of water and repair plumbing at different subway stations.

Respectfully submitted,

(Signed) ROSALIE BELL, M. D., Medical Inspector.

REPORT ON NEW YORK RAILWAYS

March 4, 1918.

Hon. JAMES L. GERNON,
First Deputy Commissioner,
State Industrial Commission.

DEAR SIR:

In accordance with your request I have made an investigation of the complaints made by the Central Federated Union of New York and the Central Labor Union of Brooklyn and Queens regarding the employment of women on the elevated, trolley and subways.

The New York Railways (Theodore Shonts, president), operates numerous lines of surface cars in the Borough of Manhattan. Since Dec. 4, 1917, it has employed women as conductors. At the present time it has about 462 women conductors.

The company's employment office is located at Fiftieth Street and Seventh Avenue. Applications are received from 9 a. m. to 5 p. m., and all women applicants are interviewed by a woman who is in charge of the women's department of employment.

The applicant must be twenty-one years of age and 5 ft. 5 in. in height. She is required to fill out an application blank (form attached), and later undergoes a physical examination at the private office of the physician who makes the examination (form attached). Four physicians—three male and one female—are employed by the company to examine all applicants. Another physician with an office at headquarters examines employees who wish to enter the association. He also renders them medical and surgical aid at their homes when necessary.

When applicants have successfully passed the physical examination, etc., and are accepted, they are detailed to the school of instruction also located at headquarters, Fiftieth Street and Seventh Avenue.

The instruction consists in lectures, etc., relative to filling out day cards, recording number of trips, fares, transfers, etc. This instruction is usually completed in one day, after which the applicants accompany an experienced conductor on their cars for several days, thereby receiving practical demonstrations and instructions. The entire course requires usually about five days, during which time they receive $2 per day from the company. When they give entire satisfaction, they receive an appointment and are detailed to one of the numerous car depots throughout Manhattan.

The uniform consists of a cotton khaki colored cap, blouse, bloomers and puttees, with ordinary shoes. Each conductor is provided with a badge, puncher and police whistle.

The eight car depcts of the company are at: Fiftieth Street and Seventh Avenue; Fiftieth Street and Eighth Avenue; Fifty-fourth Street and Ninth Avenue; One Hundred and Forty-sixth Street and Lenox Avenue; Forty-second Street and North River; Twenty-third Street and North River; Fourteenth Street and Avenue B and 605 Grand Street.

Fiftieth Street and Seventh Avenue Depot

The number of female conductors detailed to this depot is 168. They serve on the following lines: Broadway and Columbus Avenue, Broadway and Amsterdam and Seventh Avenue.

The rest room is at Fiftieth Street and Seventh Avenue headquarters, and will accommodate about 174 conductors. It measures about 40 ft. x 20 ft., is ventilated by two windows, is heated by steam and lighted by electricity. It contains seventy-two lockers, two tables, ten chairs, three bowls and two wash basins. There are hot and cold water, liquid soap, paper towels and every convenience.

I interviewed four conductors:

1. Mrs. A. B., about twenty-five years of age. Husband has been drafted. Has child six years old. Worked in a factory before her marriage. Has been employed as conductor for one month. Has never worked more than ten hours per day. Seems to be in excellent health.

2. F. S. Formerly employed as assistant paymaster by a tobacco corporation. Received $17 per week. She says she prefers this work. Seems to be in good health.

3. B. U., about thirty-five years of age. Formerly a practical nurse. Gave up that work as she did not wish night work. At present she works during the day and is able to take a day off whenever she finds it necessary. She prefers a "hobble" car, which allows the conductor to sit all day. She has been employed since Dec. 11 and claims that her health has improved. She seems in good health and is extremely intelligent.

4. C. B., about twenty-five years of age. Born in Ireland. Formerly employed as lady's maid at $35 per month. Has worked as conductor since Dec. 11, 1917. She also prefers a "hobble" car, as this permits her to sit all day. She is very robust in appearance and seems to be in perfect health.

Fiftieth Street and Eighth Avenue

There are ninety-five female conductors detailed to this depot. They serve on the Ninth Avenue cars.

The rest room is large and square (about 30 ft. x 30 ft.), ventilated by one large and three small windows, heated by steam and lighted by electricity. It is furnished with three tables, numerous chairs and several benches. There are 120 lockers here, a telephone and adequate toilet facilities. I interviewed several conductors, as follows:

1. R. A., twenty-two years of age, of Swedish birth. Formerly employed as a governess and received $30 per month with room and board. Has been employed as a conductor for the last eight weeks. She is detailed to a platform car and cannot sit down very often. For the first few days she had a backache, but that gradually disappeared. Her feet have never troubled her. She is of robust appearance and possesses good health, though at times she is obliged to rest for a day or two. This is perfectly agreeable to her employers and for that reason she prefers this position to one in which she would be obliged to be constantly on duty. She begins her first run at 12.25 p.m. and works until 3.30 p.m., then swings 6.25 p.m. to 1.05 a.m. She does not object to working past midnight and never has had any trouble with passengers.

2. Mrs. B. S., twenty-seven years of age. Formerly employed as waitress, later as cashier in a bathing pavilion at Asbury Park. Has been married eight months. Has worked here about eight weeks. Hours from 7.45 a.m. to 7.33 p.m. with intervening swings. At first work made her ache all over, particularly her arms. This disappeared in about four or five days. Since that time she has not been affected and claims to be in excellent health.

3. Mrs. L. S., about thirty-eight years of age. Formerly employed as a trained nurse. She has three children, eldest nineteen years of age. Employed as conductor for the last six weeks. Has not been affected in any way.

Fifty-fourth Street and Ninth Avenue

Fifteen female conductors are detailed to this depot. They serve on the Ninth Avenue line.

The rest room is about 30 x 30 ft., ventilated by three windows, heated by steam, lighted by electricity, furnished with one long table, five settees and numerous chairs. There are three shower baths at this rest room. In the toilet rooms are the bowls, two wash basins, paper towels and every convenience. I interviewed several conductors:

1. Mrs. M. M., twenty-six years of age. Has one child six years of age. Formerly employed as a coat checker in Jack's restaurant. Received $10 per week. Has been employed as conductor for the last two weeks. Begins work at 11 a.m. and finishes at 1.05 a.m. with intervening swings. She has a very robust appearance and claims to be in good health.

2. Mrs. A. D., twenty-one years of age. Has never worked before. Has been employed for the last three days and claims to be in perfect health. She seems less than 5 ft. 4 in. in height, and I advised her to serve on a hobble car.

3. G. P. Formerly employed as cashier by the Edison Company and received $9 per week. Has been employed as conductor for the last eight weeks and serves on a Broadway and Amsterdam "hobble" car. The doors of this car are opened and closed by the pressing of a pedal. She informed me that the amount of force required was but slight—a mere touch is sufficient. After working a few days she had slight rheumatism in one arm, but this condition has disappeared. Her hours are from 12.55 p.m. to 4.15 p.m., then swings to 6.55 p.m. to 1.30 a.m. She does not object to night work.

One Hundred and Forty-sixth Street and Lenox Avenue

Ten female conductors are detailed to this depot. They serve on the One Hundred and Forty-fifth Street and One Hundred and Twenty-fifth Street lines.

The rest room measures about 25 ft. x 20 ft. It is well lighted and ventilated, heated and furnished with three benches, a table and ten chairs. The toilet room has six bowls and three wash basins.

This is not intended as a regular rest room, but as a stopping place, at the end of different lines. No conductors were resting here, so I was unable to interview any.

Forty-second Street and North River

The female conductors detailed to this depot are fifty-five. They serve on the Thirty-fourth Street line. The rest room is about 25 ft. x 15 ft., ventilated by two windows, heated by steam and lighted by electricity. It is furnished with a table, ten chairs and eighteen lockers. There is a toilet but no wash basin. A telephone has been installed. I was unable to interview any of the conductors.

Twentieth Street and North River

The female conductors detailed to this depot are thirty-nine. They serve on the Twenty-third Street crosstown line. The rest room is about 15 ft. square, ventilated by two windows, heated by base-burner stove and furnished with a table, two settees and seven chairs. There are sixteen lockers and a telephone has been installed. I interviewed one conductor.

1. M. C., about thirty-five years of age. She has had various positions and experiences. First as a governess in England; later as proprietor of a tea room in Vancouver, B.C. She has been in New York one year and was employed previously as a passenger elevator operator in Greenhut's, but this work was very trying on account of the bad air she constantly breathed. She has been employed about one month as conductor and prefers it on account of the fresh air. She claims some of the passengers are insulting and she has been obliged to reprimand them. She prefers the closed car which enables her to sit down. At times she is obliged to take a day off. She claims her health has improved. This woman seemed extremely intelligent, refined, well educated and not of a very robust appearance, and rather unsuited to the work. She expects to return to England as soon as conditions there are more favorable.

Fourteenth Street and Avenue B

Fifty-one female conductors are detailed to this depot. They serve on the Fourteenth Street Crosstown and Eighth Street lines. The rest room is on the top floor of the building, and measures about 40 ft. x 20 ft. It is ventilated by one window, heated by steam and furnished with a table, three settees and numerous chairs; twenty-four lockers and a telephone have been installed. There are three bowls and three wash basins. I interviewed two conductors.

1. Mrs. S. M., about thirty years of age. Has three children. Formerly employed as saleswoman in Woolworth's and received $7 per week. She has been employed as a conductor for the last month and does not find the work as hard as that of her former occupation. She has placed her children in a home and once a week, during a swing, she is able to visit them. She works from 6.17 a.m. to 9.16 a.m., then swings to 11.59 a.m. to 3.02 p.m., then swings to 5.11 p.m. to 7.50 p.m.

She is a rather fragile-looking woman, but claims to be in good health. Her feet were very tender and swollen at first, but at present do not bother her.

2. M. M., about twenty-two years of age, born in Italy. Formerly employed as a cashier in a theater and received $8 per week; later as a finisher on suits and made about $18 to $19 per week piece work. Has been employed as conductor for the last month. She works from 7.07 a.m. to 8.40 a.m., then swings to 11.42 a.m. to 1.52 p.m., then swings to 4.37 a.m. to 9.09 p.m. She has not become quite accustomed to the work and doubts whether or not she will continue it.

Grand Street

Twenty-nine female conductors are detailed to this depot. They serve on the following lines: Spring Street, Madison Street, Houston Street and Prince Street. The rest room is located on the top floor of the building, and is about 50 ft. x 20 ft. It is ventilated by five windows and a skylight, heated by a large base-burner stove and furnished with a long table, four settees, and eight chairs. Twenty lockers and a telephone have been installed. Two bowls and two wash sinks are located on the opposite side of the hall.

This is a very bright, cheerful room and in my opinion the most comfortable and attractive rest room. I interviewed two conductors.

1. C. S., twenty-two years of age. Formerly employed as waitress in St. Catherine's Hospital, Brooklyn, where she received $18 per month with room and board. When I asked her why she worked in Manhattan when she lived in Brooklyn, she informed me that she considered the uniform of Manhattan conductors more attractive than that of the Brooklyn Rapid Transit conductors. She serves as follows: Spring and Delancy Street from 12.18 a.m. to 3 p.m., then swings to 4.44 p.m. to 12.02 a.m. Bridge local, 7.17 a.m. to 12.58 p.m., then swings to 2.58 p.m. to 7.20 p.m. She seemed to be in good health.

2. F. K., twenty-two years of age. Formerly employed as saleswoman by Woolworth's. Received $7.75 per week. Later received $10 per week as saleswoman in a store. She serves on a Spring and Delancy Street car from 6.12 a.m. to 8.47 p.m., then swings to 11.45 a.m. to 3.30 p.m., then swings to 5.06 p.m. to 7.30 p.m. She claims to be in good health and not inconvenienced by the long hours.

This completes the investigation of the rest rooms and women conductors.

Conclusions

As well as I could judge, all employees were courteously and kindly treated and had no complaint to make.

The New York Railways Company seems to be doing a great deal for its employees. A number of rest rooms have been comfortably equipped and inspected and supervised by a woman inspector.

A well-equipped dispensary is maintained at Fiftieth Street and Seventh Avenue. Here a physician and trained nurse are in daily attendance. They treat all accidents and injuries among the employees. Illnesses of various kinds are treated by the association's physician in another office located on the floor above. Trained nurses visit the employees when necessary.

Arrangements have been made with several hospitals whereby employees of the New York Railways can receive treatment when necessary.

The women seem to be in good physical condition. Those who were handicapped by an occasional disability were able to take from one to four days off per month

with the consent and approval of the company. Many were able to select the hours they preferred; also the type of car.

In reading over the histories of these women conductors, it will be observed that nearly all had been employed previously in some less remunerative work and were accustomed to constant standing.

All had been subjected to a complete physical examination.

I questioned the physician and nurse on duty the afternoon I inspected the school of instruction and dispensary. Both informed me that the women were in good condition, and the commonest complaint among them was that of twisted ankles, caused by wearing extremely high heels and jumping off the cars.

Some of the conductors are on duty from twelve to thirteen hours per day, although they work but ten hours or less, with intervening swings.

In my opinion, this is too long a stretch. In addition they work seven days per week. It is true that the Sunday schedule requires shorter hours and that they are permitted to take a day off whenever necessary.

At present all seem to be in good condition, but whether or not they will be able to remain on duty so many hours, day after day, without a weekly day of rest remains to be seen. Many of the women have been employed as conductors for the last three months. A few lay off on an average of one day per week.

I make the following recommendations:

1. Regulate the hours of employment that all may have one day of rest in seven.

2. Regulate the length of runs, making one hour and thirty minutes the maximum length of time between car depots or toilet facilities.

Respectfully submitted,

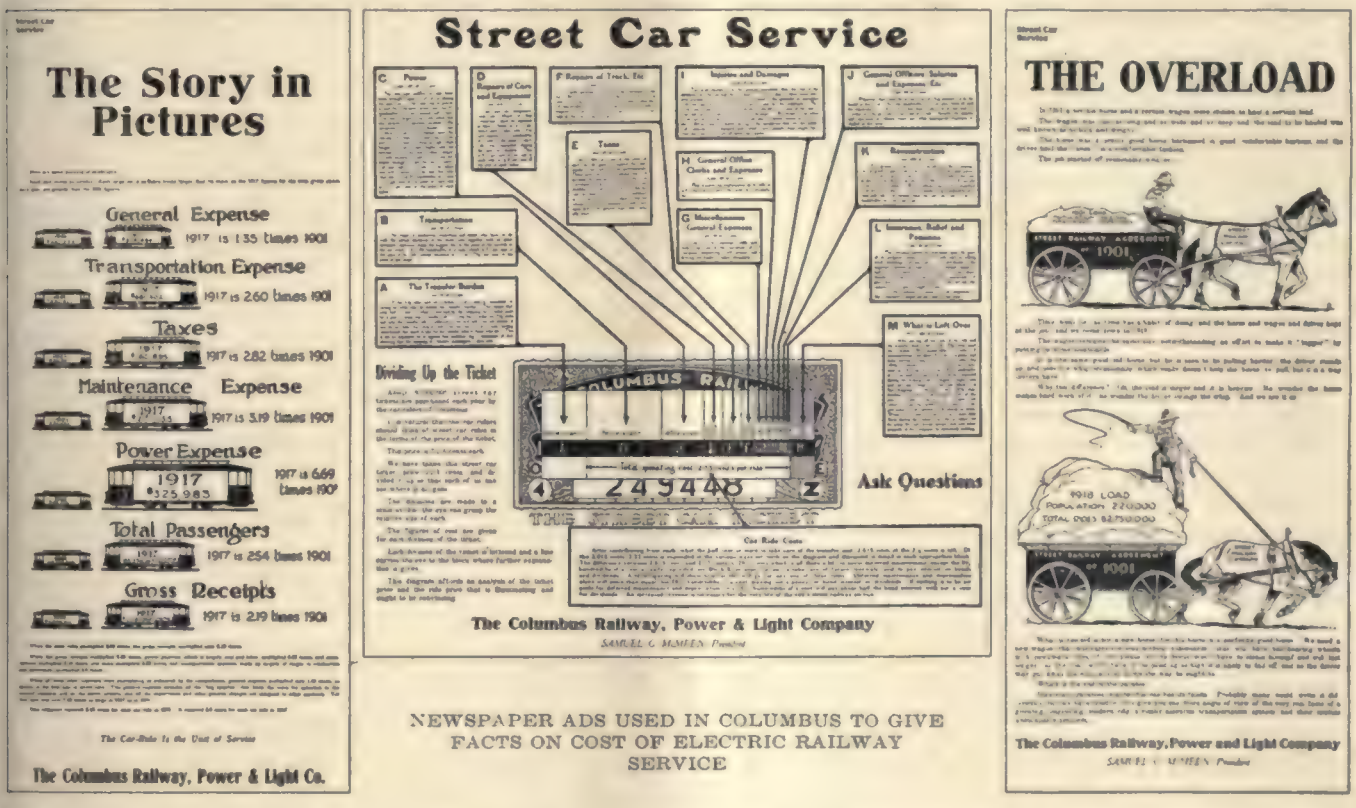
(Signed) ROSALIE BELL, M. D., Medical Inspector.

Telling the Public

Columbus Company in Newspaper Advertisements Is Presenting Facts About the Present Cost of Electric Railway Service

THE Columbus Railway, Power & Light Company, Columbus, Ohio, has been conducting a noteworthy advertising campaign to acquaint its patrons with the reasons for its application for an increased fare. Previous references to some of the advertisements were made in the ELECTRIC RAILWAY JOURNAL of March 9, page 480, and March 23, page 589. The accompanying illustration shows three additional advertisements that have been selected from among those used up to the present time.

The first advertisement, shown on the left, is the pictorial story of increased electric railway cost. The data show clearly how since 1901 the expenses have outrun the receipts. This advertisement, as well as the others, also emphasizes the idea that the car ride is the unit of service given by the company, and that the receipts therefor have decreased.



NEWSPAPER ADS USED IN COLUMBUS TO GIVE FACTS ON COST OF ELECTRIC RAILWAY SERVICE

The advertisement shown in the center gives in an illuminating way an analysis of where the 3½ cents paid for each ticket goes. Each element of cost is explained in detail in the proper block, and the text emphasizes the inability of the company to meet the demands of depreciation, bond interest and dividends. Deferred maintenance and depreciation, it is said, will alone more than equal the amount available for these items, leaving nothing for interest or dividends.

The third advertisement, on the right, tells the parable of "The Overload." This presents in an unusual way the difficulty of electric railway operation under an outworn operating agreement between a railway and the municipality served.

Six-Cent Fare Permitted in St. Louis

Missouri Commission Holds That Constitutional Consent Clause Does Not Bar It From Raising Franchise Rates to Provide Adequate Revenue — Suggests Ultimate Adoption of Zone System

CAR RIDERS in St. Louis, Mo., must pay a 6-cent fare after June 1. This is the happy finding of the Missouri Public Service Commission on the application of the United Railways for financial relief. A preliminary note in regard to the decision was published in the ELECTRIC RAILWAY JOURNAL of May 18.

The decision is a distinct victory for those who believe that municipal franchises do not constitute irrevocable contracts leaving States without power to regulate rates. In spite of a constitutional-consent clause in Missouri, the majority of the commissioners hold that it is their duty under the law to examine the facts and fix just and reasonable rates, notwithstanding franchise terms; and if the present rates are not sufficient to permit adequate service, then the public interest and welfare demand an increase of rates.

COMMISSION HAS CONTROL OVER FRANCHISE RATES

The commission had decided in a preliminary report on the petition of the company, as noted in the issue of March 9, page 477, that it has the power to change franchise rates. In view of the importance of the decision and the recent finding of the New York Court of Appeals in the Rochester case [E. R. J., April 13, page 696; April 27, page 811], however, the commission further examined the authorities. As a result it adheres to its former ruling and believes that its power cannot be seriously questioned. The decision as to jurisdiction was made under the following heads:

1. *Constitutional Clause Not a Grant of Power to City*

The opposition contended that Section XX, Article 12, of the State Constitution, by requiring municipal consent to railway construction and operation, prevents the State from altering the rates during the fifty-year franchise life. In the commission's opinion, however, the only harmonious construction is to hold that this article, when construed with other constitutional provisions regarding the police power and the control of the Assembly over rates, either does not delegate the power of the State to the city or, if it does, the city is empowered to fix or agree to rates only until the State elects to change them.

Continuing on this point the commission says in part:

"There is much merit in the contention that Section XX, Article 12, is not a grant of power to the city but is merely a limitation upon the power of the Legislature.

"Street Railroads; Chapter 155 R. S. Mo. 1889; Chapter 33, Article 5, R. S. Mo. 1909. State ex rel Kansas City vs. Ry. Co., 140 Mo. 539; Birmingham, etc. Ry. Co. vs. Ry. Co., 79 Ala. 465; Beekman vs. R. R., 153 N. Y. 144, 152; Farrell vs. Railroad Co., 61 Conn. 127; Citizens Street Ry. Co. vs. Africa, 100 Tenn. 27; City of Detroit vs. Ry. Co., 56 Fed. (Mich.) 867, 880; Chicago, etc. Ry. Co. vs. People 73 Ill. 514; People vs. Mutual Gas Light Co., 38 Mich. 154; People vs. Ry. Co., 92 Mich. 522.

"The lack of authority in the city to deprive the State of the power to regulate the rates also appears from the line of cases holding that the city cannot grant an exclusive franchise to an electric railway line upon its streets. This is the holding under both constitutional and statutory provisions, and shows that the city is not supreme in imposing conditions in its consent.

"St. Louis Transfer Ry. Co. vs. St. Louis Merchants Bridge Ry. Co., 111 Mo. 666; Grand Ave. Ry. Co. vs. Citizens Ry. Co., 148 Mo., l. c. 672; Birmingham, etc. Ry. Co. vs. Ry. Co., 79 Ala. 465; Parkhurst vs. Ry. Co., 23 Or. 471; Detroit Citizens Ry. Co. vs. City of Detroit, 110 Mich. 389, 171 U. S. 48. Booth on Street Railways (2nd Ed.), Sec. 29.

"The contention that Section XX, Article 12, is not a grant of power to the city to fix or regulate rates is also sustained by the following cases:

"State ex rel vs. Telephone Co., 189 Mo. 83; City of St. Louis vs. Bell Telephone Co., 96 Mo. 623; State vs. Pub. Serv. Comm., 270 Mo. 429; State Pub. Serv. Comm. ex rel vs. Railroad, 275 Ill. l. c. 570, P. U. R. 1917 B, 1046; Chicago vs. O'Connell 278 Ill. 591, 166 N. E. 210, P. U. R. 1917 E, 730; Woodburn vs. Pub. Serv. Comm., 161 Pac. 391, P. U. R. 1917 B, 967; Re Utah Light & Traction Co., P. U. R. 1918 B, l. c. 502."

2. *Rates Are Subject to State Regulation*

It may be, the commission remarks, that the city was empowered under Section XX, Article 12, or under its general power to contract, to impose or to fix rates by agreement with the company, but whatever its authority to enact the franchise ordinance the same was necessarily adopted subject to the provisions of the Constitution, reserving the rate-making power to the State and requiring the charter and ordinances of the city to conform always to the laws of the State. While the city had the right to refuse its consent, yet when this was given, it could not thereby deprive the State of its power to regulate the rates thereafter.

3. *Power to Regulate by Compulsion*

The fact that the city may have had authority as between itself and the company to make an agreement as to rates does not, to the commission's mind, mean that it had the right to contract away the police power of the State to fix rates by compulsion. This power had not been delegated or surrendered to the city. The rule is said to be well stated by the Oregon Supreme Court in Woodburn vs. Public Service Commission, 161 Pac. 391, P. U. R., 1917 B, l. c. 977.

"The right of the State to regulate rates by compulsion is a police power and must not be confused with the right of a city to exercise its contractual power to agree with a public service company upon the terms of a franchise. * * * The power to fix rates by compulsion is not granted to cities or towns; nor is the right of the Assembly to legislate upon that subject curbed by the State Constitution, because in its essence it is neither a municipal power nor an incident to a pure municipal power."

4. *Not an Impairment of Contract*

As to the assertion that an increase in franchise rates would be an impairment of contract, the commis-

sion holds that this is not so within the meaning of the Federal or State Constitution. (Woodburn vs. Public Service Commission, *supra*.) The State's act of regulation is not an impairment of contract but rather an exercise of a right provided in the contract.

5. New York Case Not Applicable

With reference to the recent Rochester decision in New York, the Missouri commission notes that the court expressly declined to pass upon the power of the legislature to alter franchise rates, in view of the lack of a provision in the regulatory law empowering the commission to raise franchise rates. The Missouri commission says:

"While we do not agree with the decision of the New York court, the decision is not in point in this case, as it cannot be doubted in view of the enactments and course of legislation in Missouri that it was the intention to confer, and the Legislature did confer upon this commission by the public service commission act of 1913, the power to regulate rates prescribed in franchises as well as other rates."

Having decided that it has power over franchise rates and having analyzed all the data, the commission discusses the question of relief. Pending a valuation of the property which the commission will make hereafter, through its own engineers, at as early a date as practicable, it is of the opinion that the investment, within the limits of the city of St. Louis, should be placed at $52,800,000. The average net annual return to which the company is entitled, after paying operating expenses and taxes and providing a reserve for replacements, including both minor and major obsolescence, is $3,168,000, or at the rate of 6 per cent.

COMPANY IS ENTITLED TO RELIEF

The commission estimates the operating revenue for 1918 at $12,731,792, which is about 3 per cent less than for 1917. The reduction is based partly upon a comparison of the revenue for January and February, 1918 (exclusive of the strike period), with the corresponding period of 1917, showing a decrease of 4.24 per cent for 1918; and upon a similar comparison for the first three months of the same years, showing a decrease of 2.83 per cent for 1918.

The commission believes that the reserves set up by the company are reasonable, to wit: Depreciation reserve, 10 per cent of gross revenue; injuries and damages reserve, 6 per cent of gross revenue, and insurance reserve, three-fourths of 1 per cent of gross revenue. The amounts credited to the depreciation reserve were $1,228,836 in 1913; $1,054,296 in 1914; $1,107,344 in 1915; $1,264,129 in 1916, and $1,312,555 in 1917. The total estimated amount to be reserved each year is $1,805,795. This exceeds the amount actually credited during any year cited. In the commission's opinion, the practice of the company does not make an excessive provision for depreciation.

The amount of $938,500 is estimated as the net income available for interest and dividends in 1918. This return is $2,229,500 less than the company is entitled to receive on the basis of the tentative valuation and is $1,584,730 less than the amount required to pay the interest on the funded debt.

It is apparent, the commission believes, that the company is entitled to temporary relief, and that the ultimate interest of the city likewise demands that such relief be granted. A reduction in service is not considered advisable at this time.

The commission remarks that the adoption of a zone system of rates, with a reduction in the fare for short rides to 3 cents or 4 cents, and an increase in the fare for long rides, approximately proportional to the distance traveled, would offer the most equitable solution, although it would entail some readjustment of real estate values and would undoubtedly be opposed at present by a large portion of the people of the city. Moreover, it would probably require the reconstruction of the cars at considerable expense, so as to permit the use of the "pay as you leave" system of collecting fares in place of the present "pay as you enter" system.

ZONE SYSTEM SHOULD BE CAREFULLY CONSIDERED

The company is adverse to the adoption of the zone system at this time, and, under all the circumstances, the commission concludes, for the present at least, to retain the system of uniform rates for all distances within the city limits, though it would urge upon both the city and the company a careful consideration of the zone system, with a view to its ultimate adoption as soon as the public can be brought to a realization of its advantages.

The commission looks upon a transfer charge as very undesirable and working a hardship upon a considerable portion of the traveling public. Increasing the fare for adults to 6 cents within the city and retaining the 2½ cents fare for children, however, will provide an estimated increase in revenue of $2,026,079, which is approximately $200,000 less than the required increase. The commission therefore concludes that such fares shall be allowed. The company will be required to issue coupon books, without reduction of rate.

The commission will retain control over the case and will so change the fare from time to time, by a reduction either in the basic rate or in the price of coupon books, as to insure a net average return as allowed, and no more. The commission adds, in concluding:

"If the company will agree to set aside any excess earnings, above the net return herein allowed, for interest and dividends, in a fund to be used as a reserve or to be expended for extensions, improvements and betterments with the consent of the commission, without capitalizing same as against the city and with due regard to the principle that such excess earnings shall primarily accrue to the public's benefit, it will not be necessary to change the rates as often as might otherwise be deemed advisable, as the city would receive the benefit of such excess earnings as might accrue. The commission, therefore, would entertain a proposition from the company in line with the above suggestion.

"The company has expressed a willingness to grant an increase of 10 cents per hour in the wages of motormen and conductors and a corresponding increase in the wages of all other employees whose salaries do not exceed $200 per month. The commission has based its estimate of operating expenses on such an increase in wages. The commission, however, does not hereby fix and determine this increase in wages, believing that the wages should be determined by arbitration."

Annual Brown Book Issued

Central Electric Railway Association and Allied Bodies Publish Their Official List for 1918

BROWN BOOK No. 8 of the Central Electric Railway Association, Central Electric Traffic Association and Central Electric Accountants' Association was issued from Indianapolis on May 15. It contains a list of officers, committees and members of the different associations, with their annual reports and other matter of interest relating to them. A list of the chairmen of the different committees follows:

CENTRAL ELECTRIC RAILWAY ASSOCIATION

Auditing Committee—Walter Shroyer, Anderson, Ind.
Annual Transportation—H. A. Nicholl, Anderson, Ind.
Bureau of Standards—Adolph Schlesinger, Anderson, Ind.
Constitution and By-Laws—A. W. Brady, Anderson, Ind.
Finance Committee—F. D. Carpenter, Lima, Ohio.
Hotel and Arrangement—S. D. Hutchins, Westinghouse Traction Brake Company.
Joint Interline Folder—E. B. Peck, Indianapolis, Ind.
Membership—A. C. Blinn, Akron, Ohio.
Military Efficiency and Defense—A. W. Brady, Anderson, Ind.
Program—E. B. Peck, Indianapolis, Ind.
Publicity—E. R. Kelsay, Toledo, Ohio.
Resolutions—A. W. Brady, Anderson, Ind.
Rules Governing Interchange of Equipment—H. A. Nicholl, Anderson, Ind.
Standardization—H. H. Ross, Toledo, Ohio.
Uniform Charges for Repairs to Interchanged Equipment—H. G. Gilpin, Springfield, Ohio.
Supply Men—S. D. Hutchins, Westinghouse Traction Brake Company.
Transportation—G. K. Jeffries, Indianapolis, Ind.
Track and Roadway—T. R. H. Daniels, Indianapolis, Ind.

CENTRAL ELECTRIC TRAFFIC ASSOCIATION

Auditing—Walter Shroyer, Anderson, Ind.
Booster—F. D. Norviel, Anderson, Ind.
Conference—F. D. Norviel, Anderson, Ind.
Conference with Central Freight Association and Central Passenger Association—J. H. Pound, Benton Harbor, Mich.
Constitution and By-Laws—C. J. Laney, Akron, Ohio.
Freight Rates—F. D. Norviel, Anderson, Ind.
Interchangeable Penny Coupon Ticket—W. S. Whitney, Springfield, Ohio.
Interline Baggage—O. H. Murlin, Dayton, Ohio.
Joint Passenger Tariffs—W. S. Whitney, Springfield, Ohio.
Joint Freight Tariffs—J. H. Pound, Benton Harbor, Mich.
Military Traffic—F. D. Norviel, Anderson, Ind.
Official Classification—W. S. Whitney, Springfield, Ohio.
Joint Exception Tariff—C. O. Sullivan, Lima, Ohio.
Joint Weight and Inspection Bureau—J. H. Crall, Indianapolis, Ind.
Official Interurban Map—G. M. Patterson, Fort Wayne, Ind.
Official Interurban Guide—C. O. Sullivan, Lima, Ohio.
Rules Governing Settlement of Freight Claims—F. D. Norviel, Anderson, Ind.
Storage and Demurrage—C. O. Sullivan, Lima Ohio.

CENTRAL ELECTRIC RAILWAY ACCOUNTANTS' ASSOCIATION

Clearing House—E. L. Kasemeier, Springfield, Ohio.
Compiling—L. T. Hixson, Indianapolis, Ind.
Freight and Express Accounts—Walter Shroyer, Anderson, Ind.
Light and Power—A. E. Dedrick, Youngstown, Ohio.

In the Heart of the Allegheny Mountains

FAR up in the Allegheny Mountains at Bluefield, W. Va., at the eastern terminus of the Norfolk & Western electrification, is a small trolley line operated by the Appalachian Power Company. Although the railway end of this company's business is only 4 to 5 per cent of its total gross, it operates the property on the principle of selling transportation. Bluefield itself has some 18,000 people and Graham, Va., with which connection is made, has only 2500. Nevertheless, the railway carries 6000 passengers a day in five cars. At no time are more than eight cars in service.

The longest straightway ride is 3 miles, but it is possible to ride 5 miles on a transfer. Because of the mountainous character of the section, the track is practically of shoestring character since it follows the valley.

When the present interests took hold, about five years ago, the service was poor and unappreciated. Old single-truck cars were used, and these were operated only at intervals of twenty minutes. These cars were replaced with double-truck cars, to which two new steel single-truck cars were added last year, and the headway was cut to ten minutes. This produced at once an increase of 25 to 30 per cent in gross income. Since then travel has grown at the rate of 10 per cent a year, or practically in parallel with the increase in population. There are no jitneys but quite a number of private automobiles which draw some business from the railway through the hospitality of their owners. These are expected to diminish gradually in view of government restrictions on output of machines, etc. Up to Feb. 1, 1918, franchise stipulations compelled the company to sell workmen's tickets at the rate of fifty for $1.50 and tickets good at any time at the rate of six for 25 cents. On presentation of its case, the West Virginia Public Service Commission permitted the company to change to a straight 5-cent fare. There was no protest. This change has caused a drop of 10 per cent in travel but an increase of 8 per cent in gross. Most of the traffic comes from railroad employees, clerks and merchants. Even the latter would travel on the 3-cent tickets.

The labor problem in this high-wage, coal-mining center is just as hard for this company with its small number of railway men as for many a big system. About half the men, says Herbert Markle, general manager, stick to their jobs, while the rest are floaters. Within the past year wages have been raised twice—a 5 per cent increase in wages and then a 10 per cent war bonus—making the average wage about 30 cents an hour.

Just as soon as the proper track labor can be obtained, a passing track will be put down in the heart of Blue-

field to permit the effective operation of one-man cars. The present rolling stock is vestibuled, but no air brakes are installed. One-man operation is recognized by the management as the only way of continuing to give good service with some return on the investment.

LETTERS TO THE EDITORS

Limitations in Track Spiral Standardization

BROOKLYN RAPID TRANSIT COMPANY

BROOKLYN, N. Y., May 21, 1918

To the Editors:

Relative to the article by E. M. T. Ryder describing a proposed uniform system of spirals and the editorial thereon appearing in the issue of April 6, 1918, I wish to submit the following comments:

The proposed spirals, being based on the use of 5-ft. chords subtended by the center line of successive variable radii and consequently requiring all engineering data to be based on the center line of curve, are directly opposed to the established street railway practice of referring all engineering data to the inner gage line of curves. For this reason, instead of simplifying the methods of computation, the proposed spirals would only add to the labor of computing.

As a result of the rather long chords proposed, the ends of the spirals would be projected beyond the first frog into the curved crossing in double track lines, which, as will be understood by special work draftsmen, complicates computations considerably; compound curves should be eliminated from frogs whenever possible. Due to the essential design of frogs the alignment of curves is broken at every intersection and the resultant shock would be accentuated if there were compound curves in them.

When used in connection with tongue switches, most spirals become spirals in name only since a considerable proportion will be taken up by the arc of the switch radius used. In the case of a 100-ft. radius switch this will amount to about 7 deg. 30 min., and if the spiral is not used through the first frog, only two or possibly three radii of the spiral remain. The importance of spirals in special work proper has been very much exaggerated. They are more needed and are more useful in connection with the plain ends of branch-offs or plain curves.

There is practically no need for deflection angles when special work is laid out, since with the rather short middle radii used in street railway work special work is manufactured to template, and the information which is given on the drawing of the manufacturers is sufficient.

As to economies to be effected by the addition of another spiral to the miscellaneous assortment now in use, neither first cost nor subsequent maintenance would be affected, and I fully agree with A. E. Harvey and the others who have so clearly explained this phase of the question in previous letters to you.

Why not revise the design of A.E.R.E.A. standard guard rail to allow the use of 12-ft. lengths upon which practically all street railway spirals are based?

M. BERNARD, Assistant Engineer.

THE CONNECTICUT COMPANY

NEW HAVEN, CONN., May 21, 1918.

To The Editors:

I have read with interest the discussion on track spirals which has been published in your paper and consider that Mr. Harvey's letter covers the case fully and that no material advantage would be gained by attempting to standardize along the lines suggested. Mr. Ryder's article shows that there is practically no difference in the actual alignment of track, no matter which of the various spirals are used. Moreover, it would be many years before this standardization could be utilized, since the greater part of special work renewals would require that the repair pieces conform to the original layouts.

I understand that one steel company alone has templates for approximately 300 different spirals now, and if a new set of spirals were adopted as standard, it would mean an additional set of templates for each of the spirals adopted as standard, thus adding that much to the present number held by this one company.

Another feature not mentioned by Mr. Ryder, nor so far as I have seen by any of your correspondents, is the fact that while Mr. Ryder's spirals are figured to center line, two of the three larger steel companies figure their spirals to inside gage line, the purpose being to allow the use of their spirals for railways having a track gage greater, or less, than the standard gage, and there are several such railways in the United States. To make Mr. Ryder's spirals standard, therefore, they should be figured for the inside gage line, or it will be necessary to have additional standard spirals for companies not using standard gage.

Mr. Ryder's statement that the proposed spirals can be laid out on the ground by transit, if desired, is not inherent in these particular spirals, since all spirals can be laid out in the same way, and while it may be true that all spirals have not been tabulated with the view of staking them, they can be easily figured and tabulated so that the proposed standards will not have any advantage over those now in use in this respect.

Personally I would hesitate to recommend the adoption of these standards for use on our lines, as I cannot see where the company would be a gainer, since we have our data so worked up that it is a simple matter to determine car clearances in making layouts.

If present business conditions are to result in a curtailment of orders, this does not seem a good time to attempt a standardization which entails the cost of new templates for all steel companies. Moreover, as I assume that most of the curtailments will be in the renewal of entire layouts, such orders as do go through would be for parts of layouts and would of necessity require the use of the existing curvatures of the pieces to be renewed. There is so little difference between present spirals and the one proposed as standard, that it would be a step toward co-operation and economy for the railway companies to use exclusively the spirals of the three larger steel companies. This would make use of material and computations already existing, reduce the troubles and vexations mentioned by Mr. Angerer, and give results practically as close as with one standard.

W. R. DUNHAM, JR.,
Engineer Maintenance of Way.

AMERICAN ASSOCIATION NEWS

War Board Issues Bulletins

DURING the last week four bulletins have been issued by the American Electric Railway War Board. No. 16 transmits the bulletin issued by the Highways Transport Committee of the Council of National Defense on the establishment of return loads bureaus. No. 17 gives the text of the federal act approved by the President on April 20 in which electric railways are enumerated among other "war utilities" whose willful injury or destruction is punishable according to the terms enumerated in the act. No. 18 gives the text of the federal act approved on April 22 in which the President and his designated agents are empowered to take over street and interurban railroads for the transportation of shipyard and plant employees, and No. 19 is a copy of the rules issued by the National War Labor Board giving the procedure for taking up industrial disputes with that board.

Manila Company Section Holds April Meeting

THE chief feature at the meeting on April 2 of the Manila Company section was a talk by James C. Rockwell, general manager of the company, who had recently returned from the United States after a six months' vacation trip. He described the principal events of his tour, the evidences of war conditions which he had noticed and particularly the use of women conductors and guards in New York and Brooklyn. He said that the work of these women appeared to him to be excellent and the service rendered by them quite as good as that by men. In fact, he believed that it was rather better, as they had a quiet dignity about them which is too often lacking in men similarly engaged. Mr. Rockwell was introduced by Vice-President Duffy, who told of an interview which he had had with Hon. P. S. Reinsch, United States Minister to China, on the possibilities for development along commercial lines of the Philippine Islands.

"Snow-Fighting Night" at Milwaukee

AT THE APRIL meeting of company section No. 1 the entire evening was devoted to talks and discussions on snow fighting and snow-fighting equipment. R. R. Lukens, superintendent of way and structures, operating; H. A. Mullett, superintendent of rolling stock; R. H. Pinkley, superintendent of way and structures, engineering; G. M. Kuemmerlein, superintendent of transportation, and A. J. Killa, transportation department, took up the subject from the standpoints of their several departments. Supervisors Henningfeld, Wunderlich, Hackbarth, White, Throop and Hungsinger also gave interesting talks on their experiences in big snowstorms.

Mr. Lukens made a comparison between the snowstorms of 1881 and of last winter. He dwelt particularly upon the damage caused by thawing following the five severe storms of January and February. Mr. Mullett emphasized the importance of the part played by track sweepers in keeping the arteries of traffic open and described the types of sweepers in use at Milwaukee. Mr. Pinkley spoke of the formation of ice and snow and showed some slides from pictures made during recent snowstorms and also some illustrating the types of plows used. Mr. Kuemmerlein considered the delays caused by the compelling of teams and other vehicles to use the car tracks as one of the most serious problems in connection with snow handling. He told how the lines had been kept open in storms and also how expensive this work is. Mr. Killa outlined the local snow-fighting procedure and mentioned the fact that during last winter's storms some men operated sweepers as long as thirty-six hours continuously.

War Activities Reviewed at Capital Traction Meeting

AT THE FINAL meeting of the 1917-1918 season, held on May 9, by the Capital Traction Company section, No. 8, George E. Hamilton, president of the company, addressed the members and summarized the activities of the company's organization in Liberty Loan campaigns, Red Cross activities and the sale of thrift stamps. It was stated that in the two last Liberty Loan drives 505 individual subscriptions had been made from the ranks of the company for a total of $73,050, and that, including the company's investment of its reserve funds, in all three loans a total of $403,000 had been subscribed, exclusive of the individual subscriptions to the first loan of which no record was made. Red Cross memberships to the number of 375 were obtained in the campaign last December, and approximately $3,500 worth of thrift stamps sold. Eighty-nine men from the ranks of the company have entered the army or navy. After referring to what had been done Mr. Hamilton stated that although much had been accomplished, there was still a great deal to do, and he urged every member of the section to become a missionary to see that everyone understood the crisis the country is facing and put his full energies to the task in hand to the end that a successful termination may be reached in the quickest possible time.

The meeting was made the occasion of a celebration in honor of William E. Graham, foreman of the paint shop of the company, who is rounding out fifty years in the service of the company. Mr. Graham entered the employ of the Washington & Georgetown Railroad on June 18, 1868, about five years after the organization of that company which was the first street railway in the city of Washington. Mr. Hamilton paid a glowing tribute to Mr. Graham and presented him, on behalf of the company, with a check for $250, and on behalf of his fellow workers Mr. Graham was presented with a chest of silver bearing a suitable inscription.

The section had as its guests about twelve British sailors now in this country, and several of them contributed to the entertainment with songs. British official motion picture films, taken during the retreat of the Germans at the battle of Arras, were shown and gave those present a vivid picture of what modern war means. President Elon von Culin presided, and 165 members and guests were present.

The next meeting of the Capital Traction Commpany section will be held on Oct. 10, 1918.

Brake Slack Adjusters Assist in Producing Needed Economy

Automatic Adjustment of Brakes Reduces Maintenance Costs and Produces Safer Operation

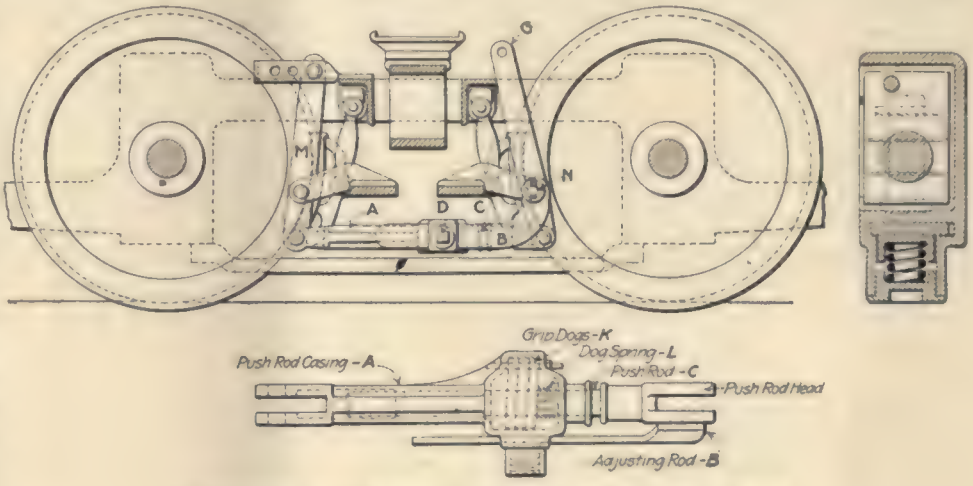
AFTER a series of trials and careful investigation, the Brooklyn Rapid Transit System recently ordered 220 sets of Gould type slack adjusters for use under cars equipped with Peckham 14-D5 trucks. Air-brake engineers have recognized for a long time the desirability of using some kind of slack adjuster as a means for obtaining maximum reliability and efficiency of the braking system by providing uniform piston travel. The Gould slack adjuster is operated by either hand or air brake application and has resulted from many years of development and experimentation. During this time many details of construction have been tried out and discarded as being unsuitable for the severe conditions of surface car operation. The present type of adjuster is designed to take the place of the bottom brake rod connection between the live and dead levers attached to the brake beam. This location has been chosen as it has been proved that any slack resulting from brakeshoe, fulcrum or pin wear can be more effectively and more quickly taken up at this point.

The operation of the Gould type adjuster will be best understood by referring to the accompanying illustration which shows the adjuster as applied to the trucks of an electric car. In applying the brake the live lever *G* moves to the right, forcing the brakeshoes on this side against the wheels. At the same time the bottom rod *C* and the casing *A* of the slack adjuster are moved toward the left. The push-rod casing *A* is attached to the lower end of the dead lever *M* and its movement brings the brakeshoes on the left side tight up against the wheels. Should wear occur in the brakeshoes or wheels, the adjusting rod *B* attached to the brake-beam fulcrum of the live lever moves to the right to the extent of the lost motion in the slot at *N*. If the brakeshoe clearance exceeds this amount, the adjusting rod *B* which is held by a friction spring and shoe, is moved to the right. This friction will then be overcome and the push-rod casing *A* will move to the left to the extent that this movement exceeds the normal brakeshoe clearance provided in the slot *N*.

When the brakes are released, the action of the release spring, not shown, and the weight of the brake beam cause the shoes to fall away from the wheels. The lost motion in the connection at *N* is taken up, which provides the necessary brakeshoe clearance. The brake beam and shoes are now held in suspension by the friction of the adjusting rod *B*, and any further movement of the live lever caused by the force of the release spring will cause the push rod *C* to move to the right through the dogs *K*, which are held in the locked position by the spring *L*. These dogs permit movement of the push rod through them to the right, but grip the rod firmly and prevent movement toward the left. The push rod is thus drawn through the grip dogs the same amount that the excess travel in the brake rigging caused the friction clamp to slide on the adjusting rod as the brakes were applied and on the next application of the brakes normal movement of the live lever will prevail until such a time as the pins, shoes and wheels commence to wear, when the action will be again repeated automatically.

The holes through the grip dogs are slightly larger than the push rod so the rod passes freely through them when they are at right angles to it, but it is locked firmly against movement in the opposite direction due to the lever action of the dogs. Both the push rod and the dogs are made of high-grade steel so the wear is scarcely discernible after years of service. The spring *L* serves to hold the dogs in the locked position and prevents rattling of parts.

To release the slack adjusters it is necessary to insert a bolt or chisel behind the dogs and move them to the right as far as they will go. The operator can then move the brake beams and shoes away from the wheels by placing a bar behind the beam and new shoes can be readily inserted. After the shoes have been replaced a single application of the brakes takes up all excessive slack and provides the correct adjustment automatically. The car is then ready for operation.



DETAILS OF THE GOULD TYPE SLACK ADJUSTER AS APPLIED TO AN ELECTRIC CAR TRUCK

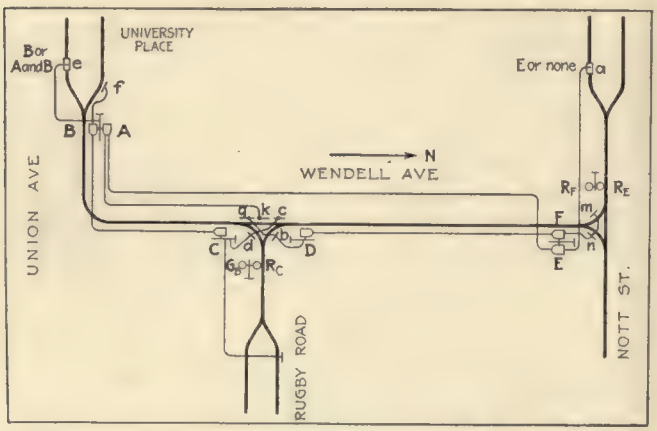
A type of Gould slack adjuster for use on locomotive tenders, freight cars and passenger cars has a release spring as part of the adjuster, and an unlocking lever is provided for unlocking the grip dogs. The pressing in of this lever forces the dogs to an upright position and permits the push rod to slide easily and give the space necessary to replace the shoes. No tools are required.

The following are some of the advantages claimed for this type of slack adjuster: (1) Water, snow, ice and rust do not interfere with its operation. (2) Slack adjustment and replacement of worn shoes can be made quickly and without necessity of placing cars over a pit. (3) Costs are reduced by obtaining more mileage from shoes and the wheels, and by requiring less time for making brake adjustments and replacements. (4) Econ-

omy is obtained in operation of the cars by using less air and power and by reducing the number of accidents. (5) Comfort to the traveling public is increased by providing smoother, safer and more rapid operation. (6) The human element is eliminated by having automatic adjustment of brakes, and a cheaper class of labor can be used for making brake adjustments. (7) These adjusters can be substituted for the turnbuckles in the brake rigging and they automatically do the work of the turnbuckle.

Automatic Signals on the Schenectady Railway

THE Schenectady Railway has recently completed an installation of automatic signals on its single track on Union and Wendell Avenues, from University Place to Nott Street. The signals are Nachod automatic known as Type MD, having normal closed hold-clear circuits giving indications by lights and disks. They are operated and lighted from the trolley power and the entire signal relay, both magnets and switch contacts,



SIGNAL LAYOUT FOR SCHENECTADY RAILWAY

is immersed in oil. The trolley contactor is of the flexible wiping type without moving parts.

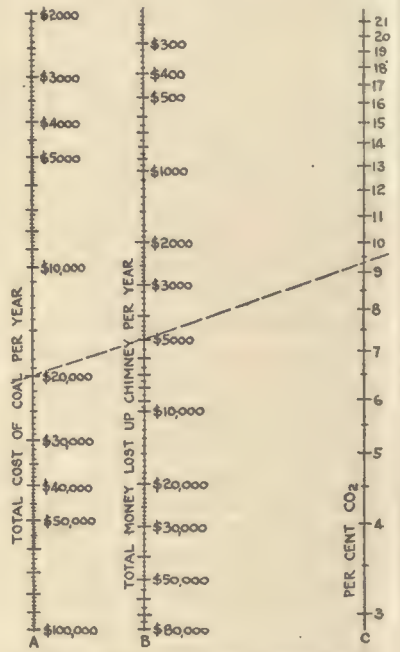
The accompanying diagram shows the signal locations and their connections. The object of the layout is to block opposing movements respectively through a long block, *AE*, and also through a short block, *AC*, which is included within the long block, to permit following movements through each of these blocks, to permit opposing movements between the long and the short routes as far as the limits *C*, of the common track, and to prevent meeting on the long route except at the ends *A* and *E* of the long block. The special features of the layout are that contactor *e* when traversed with power will set two blocks of signals, and without power but one block. When traversed with power, contactor *a* will set one block, and without power will not affect the signals. The preliminary contactor located at the double track on Rugby Road will set the opposing signal *B* at stop as soon as the car starts to leave the double track and before it gets to the main single track block *CB*, but this block will also be completely controlled by contactor *d* or *c*.

The signals were furnished by the Nachod Signal Company, Inc., Louisville, Ky., and were installed by the railway company under the supervision of the signal company.

High Carbon Dioxide Percentage Indicates Good Boiler Room Operation

THE accompanying chart gives a ready means of determining the relation of percentage of carbon dioxide (CO_2) and operating economy. The chart connects percentage of CO_2, total annual cost of coal and total annual heat loss up the chimney. When a straight edge, represented by a broken line in the diagram, is laid across the chart through points selected on two of the lines, the corresponding value of the other quantity can be found by the intersection of the straight edge and the third line. For example, if $20,000 is spent per year for coal burned in the furnace whose average CO_2 registers 9.3 per cent then the approximate yearly loss is $5,000.

The object of this chart is to show that a high percentage of CO_2 is most desirable. To be sure even where the CO_2 is as high as 21 per cent, the theoretical maximum, there is a loss because in the average power plant the flue gases leaving the boiler have a temperature of 500 deg. or 600 deg. Fahr.



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CHART SHOWING RELATION OF CO_2 IN FLUE GASES AND ANNUAL CHIMNEY LOSS IN POWER PLANT

This chart is based on a flue-gas temperature of 600 deg. Fahr. and an outside air temperature of 60 deg. Fahr. Where the flue-gas temperature is higher or the outside air temperature is lower the money loss will be correspondingly increased. On the other hand, with a higher outside air temperature and a lower flue-gas temperature, the money loss is proportionately decreased. It has been assumed that the coal used has a heat value of 14,500 B.t.u. per pound of combustible. The chart was prepared by the Uehling Instrument Company, New York City.

Tie Tampers Help Solve Labor Problem

G. W. VAUGHAN, engineer maintenance of way, New York Central Railroad, presented a paper on tie tampers before the New York Railroad Club at its meeting on May 17. The Imperial tie tampers, as used by the New York Central Railroad, were described. Due to the present shortage of labor a foreman together with two men and a tamping outfit have been doing the work previously done by a gang of ten men. The outfit is left out on the line and is shifted by a work train crew each morning or night.

Comparison of costs for tamping by hand and with machines were given. These showed a substantial saving in favor of machine tamping.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Mayor of Toledo Questioned

Interrogated in Connection With the Injunction Preventing the City from Interfering With Fare Raise

Testifying in the Federal District Court at Toledo, Ohio, on May 17, Mayor Cornell Schreiber of that city disclaimed all responsibility for the so-called "Street Railway Commission" and said that he had not read its report, filed with him some time ago, except to glance at an occasional statement. Judge J. M. Killits agreed with him that the commission is not an official municipal body and that the Mayor is under no obligations to father its plan.

Mayor Disclaims Knowledge

This was brought out in a hearing on the injunction suit recently filed to restrain the city from interfering with the rate of fare charged by the Toledo Railways & Light Company, in which a temporary order was granted in favor of the company. Attorneys had attempted to have the Mayor identify a copy of the commission's report, but he insisted that he knew nothing about its contents and refused to comply with the request. The court upheld him.

Mayor Schreiber was also sustained in his refusal to answer questions as to what he had done toward solving the local railway dispute, as this matter is in the hands of the City Council. He had made no arrangements to keep the cars in operation and had prepared no papers looking to a receivership, had labor trouble occurred.

Testimony About Company Records

John J. Higgins, commissioner of city accounts, gave some interesting information in regard to the company's records. Taking into consideration the decrease in the number of passengers for December, 1917, and January and February, 1918, as compared with the same period a year before, amounting to 8.2 per cent, and estimating the gross operating revenue on the decreased number of passengers the coming year at a rate of fare of eleven tickets for 50 cents and cash fare of 5 cents, this revenue would be within $2,000 of the gross operating revenue for the entire calendar year of 1917. On this basis, he said, any increased wages paid the men would be a reduction of the company's return on its investment. The rate of eleven tickets for 50 cents and 5 cents cash fare would not provide the company with any additional money.

Mayor Schreiber, who had said that this was the only increase in the rate of fare he would approve, and Director of Law Emery argued that the earnings of the power department should be figured with the total earnings. The company objected to this on the ground that it was a separate department.

Judge Killits intimated that there should be some consideration of the possible return on the investment, but Mayor Schreiber said that his idea was that an increase should be made only for the purpose of paying the men higher wages. He believed it could be shown the company now paid more than 6 per cent on the investment.

Judge Rebukes the Mayor

At the session on the previous day Mayor Schreiber said the company had been paying interest on $15,000,000 bonds, while it was on the tax duplicate for $11,000,000. Judge Killits informed him that this was an ill-advised statement—an appeal that was causing all the delay in arriving at a settlement of the railway controversy.

The court made it plain that there was no desire on his part to fix a rate of fare, but that he felt perfectly capable of doing so if such a step became necessary. That was a function that should be performed by Council, but apparently this body had not seen fit to take the matter into consideration.

In speaking of the attitude of the employees, Mayor Schreiber said that they were under contract and for that reason he did not think they were entitled to as great an increase in wages as they had asked. He did believe, however, that some plan should be formulated to give living wages.

He believed the business of the company would be increased by the influx of people to work in the war industries and that at the end of the year the records would show a different story from the one shown at the hearing.

Government Takes S. P. Electric Lines

The Federal Railroad Administration on May 10 decided that the electric lines of the Southern Pacific Company in Alameda County, California, are a part and parcel of the Southern Pacific System and as such are under federal control. A telegram to the Railroad Commission from counsel to Director General McAdoo read:

"Our investigation shows that the electric lines at San Francisco, Oakland, Berkeley and Alameda are part and parcel of the Southern Pacific System and as such are under federal control."

It is expected that this action of the government will result in the dismissal by the Railroad Commission of the application of the company for increased fares for these lines on account of lack of jurisdiction under the new order.

Report on Canadian Road

Plans to Abandon Part of London & Lake Erie and Equip Rest With 1500 Volts Direct Current

The City Council of London, Ont., has received from Sir Adam Beck, chairman of the Hydroelectric Power Commission of Ontario, a valuation and report on the London & Lake Erie Railway, operating a 28-mile route between London and Port Stanley.

The company has been in financial difficulties since the city of London took over from the private lessees, and electrified its own railroad, between London and Port Stanley in 1915. The city road had been a failure under fifty years of steam operation, while the electric had prospered in recent years.

Offer to Sell Road

G. B. Wood, Toronto, president of the traction company, last summer called a meeting of representatives of the municipalities his line traverses and stated that the company could no longer hold out in competition with the London & Port Stanley Railroad, which had been rehabilitated at a cost of more than $1,000,000, and which gave a high-speed service over a shorter route. The negotiations brought no result and London was recently offered the traction line by its owners, who asked $450,000, an amount representing one-half the bonded indebtedness of the company. Later Sir Adam, at whose suggestion the London & Port Stanley Railroad was electrified, was asked to have his engineers report on the value of the line, and on a scheme to operate it in conjunction with the London & Port Stanley Railroad.

Sir Adam now reports that the physical value of the company including lands, buildings, materials, equipment, etc., was $262,164 on April 30.

Abandonment Plan Outlined

His engineers worked out a scheme to abandon, scrap and sell the right-of-way for a stretch of approximately 9 miles from a point north of St. Thomas through that city to Port Stanley. The two railways closely parallel each other between St. Thomas and Port Stanley. He would sell the company's power rolling stock, and with the proceeds extend the line to connect with the London & Port Stanley Railroad north of St. Thomas, and he would also connect the London terminals of the two railways. He would refit the road to operate on 1500-volt direct current as does the London & Port Stanley Railroad and would purchase new cars.

The report is to be considered by the City Council soon. The company has not commented on Sir Adam's report.

War Labor Board Announces Rules

Local Cases Heard by Sub-Committees—Board Itself to Grant Hearings Only When These Fail to Settle the Controversy

After thorough consideration of the problems to be met in the operation of the National War Labor Board's machinery for the adjudication of industrial controversies, the board on May 14 agreed upon a plan of procedure and method to be followed in all cases. This plan provides for the appointment of sub-committees composed of two members to act for the board in every local controversy, and the appointment of permanent local committees in cities and districts to act in cases therein arising, and also comprehends a method of investigating industrial disputes by trained field agents sent into territories by the board from Washington. It lays down the method to be followed by persons desiring to bring a condition to the attention of the board.

Hearing by the Board Itself

Under the form of procedure established, the board itself will sit in hearing upon cases only when its sections, or sub-committees, or local committees find it impossible to settle a controversy. In such cases the board will sit as a board of arbitration, decide the controversy, and make an award.

In compliance with the direction of the President's proclamation of April 8, the board will hear appeals in the following cases:

1. Where the principles established by him in such proclamation have been violated.

2. Where an award made by a board has not been put into effect, or where the employees have refused to accept or abide by such award.

3. To determine questions of jurisdiction as between government boards.

Full Text of the Decision

The full text of the decision of May 14 follows:

1. Any person desiring to bring before the National War Labor Board an issue between employer and employees, of which the board has cognizance, shall deliver to the secretary of the board a written statement, signed by him, with his proper post-office address at his home and in Washington. The statement shall contain a brief description of the grievance and the names of the persons or corporations against whom he complains, with their post-office address.

2. Where an employer and employees both desire to submit a controversy to the board, they shall sign a short joint statement of the issue between them, with their respective post-office addresses, and request the action of the board. They shall deliver this signed statement to the secretary of the board.

3. Controversies in which the Secretary of Labor invokes the action of the board, together with the documents transmitted by him, shall be delivered to the secretary of the board.

4. Such complaints, submissions, and references by the Secretary of Labor shall be received by the secretary of the board and filed in his office, and indorsed with the date of filing.

5. The secretary of the board shall keep one docket for the filing of all complaints, submissions, and references, and shall number them on the docket in the order in which they are received and filed. Thereafter the cases shall be referred to by such number.

6. Where the complaint or submission filed shall show clearly that another board than this has primary jurisdiction therein, the secretary is authorized to direct the proper reference, and to advise the party or parties initiating the proceeding of such reference. At the next session of the board the secretary shall advise the board of his disposition thereof.

7. The secretary of the board shall digest all cases presented and bring them to the prompt attention of the board for its action.

Organization of the Board

1. Two members of the board, one from the employers' side and one from the employees' side, shall be appointed to act for the board in respect to every local controversy, the members to be named by the joint chairmen at the instance of the respective groups of the board. These members shall be called a section of the board, and shall hear and adjust cases assigned to them. If they cannot effect any adjustment, they shall summarize and analyze the facts and present the same to the board with their recommendations.

2. The secretary shall select trained and experienced men of neutral attitude to act as examiners, to accompany the sections, and to assist them in the discharge of their duty by investigation, digest of evidence, and in other proper ways.

3. The national board may appoint permanent local committees in any city or district to act in cases therein arising. In the selection of such local committees, recommendations will be received by the national board from associations of employers and from the central labor body of the city or district and other properly interested groups. Sections of the board are authorized to appoint temporary local committees where permanent local committees have not been appointed by the board.

4. Two special field representatives may be selected by the secretary from names submitted by the joint chairmen to make a joint investigation of any complaint for the purpose of ascertaining the complete facts without the intervention of sections.

Arbitration

1. When the board, after due effort of its own, through sections, local committees, or otherwise, finds it impossible to settle a controversy, the board shall then sit as a board of arbitration, decide the controversy, and make an award, if it can reach a unanimous conclusion. If it cannot do this, then it shall select an umpire, as provided, who shall sit with the board, review the issues, and render his award.

Appeals will not be heard by the National War Labor Board from the decisions of regularly constituted boards of appeal, nor from any other board to revise findings of fact.

M. O. Inquiry About June 1

The groundwork of the investigation of the question of municipal ownership in New York State, to be made by the legislative commission headed by Senator George F. Argetsinger of Monroe, virtually has been completed and it is expected that the commission will commence its real work about June 1.

In an effort to facilitate this inquiry Senator Elon R. Brown has completed an analysis of the financial condition of the cities which will be the basis of the investigation. This analysis was made after a careful study of the real estate values, assessment and debt incurring capacity of the municipalities and is designed to establish the reasonableness of the contention that the financial burden that would be cast upon cities taking over public utilities would lead to bankruptcy.

After Mayor Hylan of New York City had made his appearance before the Legislature and advocated the enactment of the Wagner-Donohue municipal ownership bill, Senator Brown persuaded the Senate to defer action upon the measure and caused the appointment of a legislative commission which will look into the whole problem and report to the next Legislature.

Chicago Men Want Increase

Members of the trainmen's unions of the Chicago Surface Lines and the Elevated Railways took action recently looking toward an increase in wages of 15 cents an hour over the present scale. Resolutions to this effect were indorsed at a meeting of the employees on May 16. It was decided to make the request first to the company officials, and failing in relief there to take up the matter with the Mayor and City Council and if necessary with the United States War Labor Board.

The wage scale for conductors and motormen of the surface lines now ranges from 30 to 39 cents an hour, the maximum being reached after four years. The new scale would give a maximum of 54 cents an hour. On the elevated lines the conductors have been getting 34 cents, and the motormen from 35 to 41 cents. Both contracts were made last June and were intended to continue in effect for three years. Officials of the unions contend that the agreement should be disregarded by both sides and a new wage scale arranged more in accord with the increased cost of living.

Boston Relief Bill Signed

Upon Acceptance by Stockholders the Property Will Pass Under the Control of Public Trustees

The bill placing the control of the Boston (Mass.) Elevated Railway in the hands of a board of five public trustees, to be appointed by the Governor, was passed by the State Senate on May 21 and signed by Governor McCall on May 22. Under the terms of this act the trustees for ten years will have power to regulate service and maintain a flexible fare system without any supervision from State regulatory bodies.

It is provided that the company shall raise $3,000,000 by the sale of preferred stock, $1,000,000 of the proceeds to be used as a reserve fund for fare regulation. The State will have the option of buying the property at any time by assuming the liabilities and reimbursing stockholders for the amount paid in. The property can be returned from public to private management at the end of the ten-year period, or thereafter upon two years' notice by legislation.

The act is to become effective upon its acceptance by the holders of not less than a majority of all the stock of the Boston Elevated Railway and of the leased West End Street Railway, and also upon the filing of a certificate that the entire $3,000,000 above mentioned has been subscribed for and at least 30 per cent paid in cash by each subscriber, and that no dividends have been declared or paid upon common stock since the passage of the act.

The principal terms of the measure and the discussion that followed consideration of the bill were reviewed in the ELECTRIC RAILWAY JOURNAL for April 20, page 778, and May 11, page 928.

City Wins Bridge Suit

The city of Seattle has won its suit against the Puget Sound Traction, Light & Power Company to collect $60,917 as the company's share of the cost of constructing the Freemont Avenue bridge. The suit was heard before Judge Calvin S. Hall, in the King County Superior Court at Seattle. The jury also returned a special finding that the company was not entitled to damages for the removal of the Stone Way bridge.

In July last the traction company filed a counter claim for $210,000, alleging this to be the amount of damages sustained by the company as the result of the removal of the Stone Way bridge. The jury disallowed this claim and upheld the city in all of its contentions. The Stone Way bridge was ordered out by the United States Engineer's office and was demolished after the Fremont bridge was completed and ready for traffic.

As a result of the verdict, the company must pay the city of Seattle not only $60,917, but interest on that amount from June 15, 1917, and $333 a month as the company's share of the cost of maintaining and operating the bridge. A price of 1 cent a kilowatt-hour was allowed the city for current used on the bridge by the company in operating its cars since June 15, 1917.

Increase in Pay in Salt Lake

The board of arbitration appointed to consider the question of wages for the employees of the Utah Light & Traction Company, Salt Lake City, Utah, has reported its findings. The award will amount to about $89,000 additional a year in the wages of trainmen, carhouse men and those in the engineering departments. The new scale for trainmen dating from May 1 is 34 cents an hour for the first year; 39 cents an hour the second year, and 42 cents an hour thereafter. The scale which has been in force called for 28 cents an hour the first year, 34 cents an hour the second year and 37 cents an hour thereafter. In its finding the board said:

"We have arrived at our conclusions as to the scale of wages entirely upon the basis of what we deem fair and just to them and not at all upon the ability of the company to pay these wages.

"The increase in wages allowed by us, amounting to about $89,000 per annum, is merely added to a deficit now existing, and which must continue to mount up, resulting in complete insolvency unless relief shall be obtained. We direct attention to this fact in order to explain the suggestion that the company make immediate application to the Public Utilities Commission for the relief to which it is entitled.

"We venture to urge upon the Public Utilities Commission such action as will give prompt and speedy relief to the company through the exercise of any and every economy of operation which can be devised, and if such economies prove inadequate, as we believe they will, to furnish the money needed to pay the increased wages which we recommend, then that such further relief be granted as may be necessary through an increase of rates."

Governor Vetoes City Bus Bill

Governor Whitman of New York has vetoed the Rowe bill permitting Buffalo to establish municipally owned and operated jitney bus lines. The Governor said:

"This bill is disapproved for the reasons set forth in the report of the Public Service Commission for the Second District, to whom the bill was referred, which report is as follows:

" 'The matter has been considered by the commission and it is our impression that the amendment seems to be so detailed and complete as to raise the question whether it does not abrogate the jurisdiction of this commission under sections 25 and 26 of the transportation corporations law as amended by chapter 667, laws of 1915. We think it would be mischievous to authorize cities to license bus lines which would not be required to procure certificates of convenience and necessity from the commission. The reasons are obvious.' "

Strike in Philadelphia

Attempt to Embarrass the Philadelphia Rapid Transit Fails Miserably as an Objective to Union Domination

The very small disloyal element among the employees of the Philadelphia (Pa.) Rapid Transit Company called a strike on May 16. That this element existed was well known to the management. In fact, the company referred to professional trouble makers in the statement which it made acknowledging the petition of the employees asking for an increased wage and requesting the company to petition Councils for an increase in fare to make the wage advance possible.

ONLY 700 MEN OUT

Only about sixteen of the eighty lines in the city were affected by the strike and none of these suffered seriously. Representatives of the men who went out claimed that 3400 men had quit. The police estimated the number of men on strike at about 1000. The company said that only 700 men were involved.

The leaders of the men who are on strike describe the movement as a self-imposed lock-out because the company refused to allow the men to wear union buttons and they decided not to work without them.

The whole affair appears to be an attempt to make capital out of the present extraordinary industrial and labor condition and seriously to embarrass the company at a time which appeared to the malcontents to be most propitious. Even the figures of the men who went out as to their own number bear witness to the need of their cause being bolstered up from sources outside.

The controversy has been reported upon to the Department of Labor by E. E. Greenwalt, commissioner of conciliation. He said that he had exhausted every effort to persuade the company to agree to some form of compromise with the men.

NO COMPROMISE

That there would be no compromise of any kind was indicated by the determination of the company, as announced previously, to continue the existing co-operative plan as at present administered until two-thirds of the men ask for a change. The co-operative plan has been in use for seven years and its scope and workings have been explained in detail to the public authorities. The outstanding feature of this plan is that the trainmen are represented at all times by a committee of their own choosing that can take up with the management all matters requiring discussion or adjustment.

Iowa Meeting Postponed

The meeting of the Iowa Electric Railway Association, set to be held in Des Moines on May 23, has been postponed to May 31. A meeting of the Iowa section of the N. E. L. A. was set for the same time.

News Notes

More Transit Lines to Open.—The Public Service Commission for the First District of New York has announced that it had fixed June 15 as the date for the opening of the new Lexington and Seventh Avenue lines of the dual subway system in New York City.

Southern Road Increases Wages.—Increases in pay of from 2 to 5 cents an hour for motormen and conductors of the Southern Public Utilities Company, which operates in Greenville, Anderson, Winston-Salem and numerous other cities in the Carolinas, was announced on May 8. The increase, effective from May 1, will depend on length of service.

National Research Council to Be Made Permanent.—In an order issued on May 11 President Wilson has made the National Research Council a permanent body. This council was organized in 1916 at the request of the President by the National Academy of Sciences to organize research and secure co-operation of military and civilian agencies in the solution of military problems.

Men and Company in Conference in St. Louis.—A general agreement between the United Railways, St. Louis, Mo., and its employees is expected without delay, it was announced on May 15 following a conference in the office of Bruce Cameron, superintendent of transportation, who is acting for Richard McCulloch, president and general manager, during his absence from the city.

Increase in Wages in Reading.—The Reading Transit & Light Company, Reading, Pa., has increased the wages of its 600 motormen and conductors in Reading, Norristown and Lebanon 1 cent an hour, to take effect on June 1. This is the second increase in four months and the sixth since April, 1916. The wages will range from 28 to 31 cents an hour, depending upon length of service.

Twin City Wage Increase.—For the second time within eight months the Twin City Rapid Transit Company, Minneapolis, Minn., on May 16, announced increases in the wages of its employees. The increases, effective on June 1, mean that each motorman and conductor will get from $7 to $10 a month more than he is now receiving. The increase will add $250,000 a year to the company for platform wages.

Statisticians and Accountants Needed.—The United States Civil Service Commission announces that the bureau of ordnance of the War Department is in urgent need of statistical experts at $1,800 to $4,500 a year; statisticians at $1,800 a year, and clerks qualified in statistics, clerks qualified in accounting, and clerks qualified in business administration at $1,000 to $1,800 a year. These examinations are open to both men and women, except the examination for statistical expert, which is open only to men.

Government Employment Agency Opens.—Within a few days the largest employment agency in America operated jointly by the federal and state governments will open for business at 116 North Dearborn Street, Chicago, Ill. Its purpose will be to serve free every employer needing help and every employee seeking work. Recently the United States Employment Service took over the handling of all railroad labor for the Western territory, which includes the district west of Pittsburgh and Buffalo.

Referendum Asked on Franchise Settlement Terms.—A petition bearing 7911 names, asking for a referendum on the United Railways' settlement bill enacted by the Aldermen of St. Louis, Mo., a month ago has been filed with the Election Board by the Citizens' Referendum League. The new charter provides that if a petition of 2 per cent of the registered vote at the last mayoralty election is filed within thirty days after the approval of an ordinance, it shall be suspended for forty days to permit the filing of supplementary proceedings.

M. G. Chace Rhode Island Fuel Administrator.—United States Fuel Administrator Garfield has announced the appointment, with the approval of the President, of Malcolm G. Chace, Boston and Providence, as fuel administrator for Rhode Island, vice George H. Holmes, who resigned for business reasons. Mr. Chace is a son of the chancellor of Brown University. He is a resident of Boston, but his business firm, Chace & Harriman, engaged in the promotion and conduct of public utilities, has its headquarters at Providence, R. I.

Wage Board to Meet in Chicago.—Hearings in the wage controversies between the electric railway operatives of Detroit, Mich., and Cleveland, Ohio, and the respective employing companies, which were scheduled to be held in the two cities on May 27 and 28, will instead be held in Chicago on May 27, according to a rearrangement of the board's schedule. These particular controversies are in charge of William H. Taft and Frank P. Walsh, joint chairmen of the board, acting as a section of the body. The entire membership of the board will meet in Chicago, however, for the consideration of, and action upon, such business as will have been presented.

E. F. C. Transportation Division in Philadelphia.—The Emergency Fleet Corporation will start moving to Philadelphia, Pa., on June 1. It is expected that within four days all the divisions will have been moved. The Passenger Transportation & Housing Division will precede all others to Philadelphia. This division will move on May 25. This was decided upon in order that the division may assist in the locating of the personnel of the corporation in suitable quarters in Philadelphia. Employees of the Passenger Transportation & Housing Division have been notified that they will be governed accordingly. This is the division of which A. Merritt Taylor is director.

New Officers of Pacific Claim Agents.—The Pacific Claim Agents' Association held its annual convention in Portland, Ore., during the week of May 6. The 1919 convention will be held in Oakland, Cal. The following officers were elected for the ensuing year: H. G. Winsor, Tacoma Railway & Power Company, Tacoma, Wash., president; W. H. Moore, San Diego (Cal.) Electric Railway, first vice-president; J. S. Mills, San Francisco-Oakland Terminal Railways, second vice-president; C. A. Blackburn, Butte (Mont.) Electric Railway, third vice-president; B. F. Boynton, Portland Railway, Light & Power Company, Portland, Ore., secretary-treasurer; S. A. Bishop, Los Angeles; J. H. Handlon, San Francisco; A. M. Lee, Seattle; F. J. Lonergan, Portland; Thomas G. Ashton, Spokane, and J. T. Rupli, Seattle, members executive committee.

Substation and Carhouse Badly Damaged.—The plant at Thirty-first Street and Lincoln Avenue, Ogden, containing equipment of both the Bamberger Electric Railroad and the Utah Light & Power Company, was damaged by fire recently to the extent of $500,000, unofficial estimate. A considerable amount of rolling stock, said to include eighteen cars and two locomotives, was also reported to have been damaged. The company has made no definite plans for reconstructing the plant, except to repair the substation. A brick wall will be built on the west side of this station, which formerly was divided from the carhouse by a frame wall. The reconstruction of the carhouse and sheds and the installation of equipment for repairing, painting and the general upkeep of the rolling stock of the company will cost approximately $100,000.

New Providence Wage in Effect.—The new scale of wages accepted by the employees of the Rhode Island Company, Providence, R. I., went into effect on May 18. Under the wage increase, the track men get 35 cents an hour; shop men, pit men, washers and cleaners, 31 to 38 cents an hour; freight house men 27 to 28 cents an hour; breakersdown, 30 cents an hour; freight employees, receiving and delivery clerks 28 cents an hour; line department men, 32.5 to 36.7 cents an hour; power department men, 21.8 to 36 cents an hour; all other clerks, excepting general office clerks, $1.40 more a week, making the pay $17.90 to $19.40; transportation men, excepting platform men, starters, inspectors and information men, 2 cents an hour more. The new schedule for motormen and conductors under the 2-cent raise will be per hour as follows: First six months, 30 cents; second six months, 32 cents; second year, 33 cents; third year, 34 cents; thereafter, 36 cents. On June 1 another cent an hour will be added to the above rate.

Financial and Corporate

Business and Costs Both Up

Detroit United Railway in 1917 Suffered Loss of Almost 25 Per Cent Net Income

Although the gross operating earnings of the Detroit (Mich.) United Railway for the calendar year 1917 gained $1,391,270 or 8.6 per cent, this amount was more than offset by the rise of $2,043,988 or 18.2 per cent in operating expenses. As a result the net earnings from operation fell $652,718 or 13.5 per cent. Other income and deductions from income showed increases, and the net income exhibited a dropping off of $705,262 or 24.4 per cent.

The same amount was credited to the depreciation reserve as in 1916, $800,000, but in the last year the dividends were increased from $843,750 to $1,118,750, and $150,000 was credited to a reserve for taxes. The dividend payment in 1917 equaled 4.89 per cent on the capital stock and undivided surplus. The balance transferred to surplus in 1917 was only $106,780 as compared to $1,237,042 in the year preceding.

The foregoing figures summarize the business of the Detroit United Railway, the Rapid Railway System, the Sandwich, Windsor & Amherstburg Railway, the Detroit, Monroe & Toledo Short Line Railway and the Detroit, Jackson & Chicago Railway. The full figures are given in the accompanying comparative statement in Table II.

TABLE I—PASSENGER AND MILEAGE STATISTICS

	1917	1916
Revenue passengers	356,208,429	335,599,802
Transfer passengers	119,962,125	119,899,335
Employee passengers	8,557,264	8,670,561
Total passengers	484,727,818	464,169 698
Receipts revenue pass'r	$0 0459	$0 0450
Receipts per passenger	$0.0337	$0.0325
Car mileage	58,957,941	54,008,437
Earnings per car-mile	$0.2956	$0.2970
Expenses per car-mile	$0 2249	$0.2077
Net earnings per car-mile	$0 0707	$0 0893

During 1917 the company and its subsidiaries expended $2,999,220 for additions to property. On Jan. 1, 1917, the depreciation reserve stood credited with $4,295,627. The balance at the end of 1917 was $5,114,827.

Passenger and mileage statistics of the system for the last two years are shown in Table I.

War Finance Board Sworn In

The War Finance Corporation, created by Congress to finance war industries and limit and control investment of capital during the war, was brought officially into existence on May 17 by the swearing in of the directors and officers in the office of the Secretary of the Treasury. The corporation has for its chairman of the board of directors Secretary McAdoo; as vice-chairman and general manager, W. P. G. Harding, governor of the Federal Reserve Board, with Sherman Allen, formerly assistant secretary of the treasury and now assistant secretary of the Federal Reserve Board, as treasurer and secretary pro tem.

The board of directors, in addition to Messrs. McAdoo and Harding, consists of Clifford M. Leonard, Eugene Meyer, Jr., and Angus W. McLean. The members of the Capital Issues Committee, which is to regulate investment of capital during the war, consists of Charles S. Hamlin, designated as chairman by President Wilson; John Skelton Williams, Controller of the Currency; Frederick A. Delano of the Federal Reserve Board; James B. Brown, John S. Drum, Henry C. Flower, and Frederick H. Goff.

The Capital Issues Committee of the Federal Reserve Board, which went out of existence on May 17 with the organization of the War Finance Corporation, issued on May 22 a final report of its activities during the four months of its organization. The committee passed on applications for the investment of capital to the amount of $478,458,386, and of this amount for new enterprises it permitted the investment of $154,102,224. For refunding purposes the committee approved the investment of $258,664,496.

Of applications considered 192 were from municipalities, sixty-two from public utilities corporations, and 108 from industrial concerns. Of these the committee gave its approval to 140 municipal, sixty public utility, and seventy-seven industrial corporations. Thirty-four municipal applications were disapproved and eighteen curtailed, twenty-four industrial applications were disapproved and five curtailed. By securing postponement for the period of the war, the committee saved from investment $19,865,000.

OPERATIONS OF CAPITAL ISSUES COMMITTEE FOR FOUR MONTHS TO MAY 17

	Municipal	Public Utility	Industrial
Number considered	192	62	108
Number approved	140	60	77
Number disapproved	34	2	24
Number curtailed	18	0	5
Amount considered	$86,878,512	$172,069,605	$219,510,269
Amount disapproved	19,791,665	6,000,000	39,900,000
Aggregate approved	69,086,847	166,069,605	179,610,269
Less refunding	21,392,312	125,860,284	111,411,900
Aggregate new issues	45,694,534	40,209,321	68,198,369
New issues last year same period	108,952,865	107,504,075	287,754,684
Analysis of new issues approved:			
Amount original applications	65,486,199	46,209,321	108,098,369
Amount approved	45,694,534	40,209,321	68,198,369
Curtailment effected	19,791,665	6,000,000	39,900,000
Analysis of applications informally discouraged:			
Number	8	3	6
Amount	$8,915,000	$7,360,000	$3,596,000

B. R. T. Finance Hearing May 28

The war Finance Corporation has set May 28 as the date for the hearing in Washington on the application of the Brooklyn (N. Y.) Rapid Transit Company for aid in meeting the $57,735,000 of 5 per cent gold notes which mature on July 1. This fact was announced to the stockholders of the company at a special meeting on May 23 by Col. Timothy S. Williams after unanimous approval of the creation of a $150,000,000 mortgage had been granted. President Williams said:

"I was in Washington on May 22 for my first conference with the members of the War Finance Corporation, which can aid your company in financing its maturity note issue. As you know, the board of directors has had the matter up with local banking officials and with government authorities, but nothing could be accomplished."

TABLE II—COMPARATIVE INCOME STATEMENT OF DETROIT (MICH.) UNITED RAILWAY FOR 1916 AND 1917

	1917 Amount	1917 Per Cent	1916 Amount	1916 Per Cent
Gross earnings from operation:				
Passenger	$16,370,239	93 9	$15,069,980	93.9
Express	1,000,869	5.7	907,771	5.7
Mail	11,748	0.1	11,828	0.1
Special car	45,083	0.3	47,088	0.3
Total	$17,427,939	100 0	$16,036,669	100 0
Operating expenses	13,259,790	76 1	11,215,802	69 9
Net earnings from operation	$4,168,149	23.9	$4,820,867	30 1
Other income	411,737	2 4	351,334	2.1
Gross income	$4,579,886	26 3	$5,172,201	32 2
Interest on funded and floating debts and taxes	2,404,355	13 8	2,291,409	14.3
Net income	$2,175,530	12 5	$2,880,792	17.9
Amount credited to depreciation reserve	$800,000	4 6	$800,000	4 9
Amount credited to reserve for taxes	150,000	0 9		
Dividends paid	1,118,750	6 4	843,750	5 3
Total	$2,068,750	11 9	$1,643,750	10 2
Balance transferred to surplus	$106,780	0.6	$1,237,042	7.7

New York Net Falls

Metropolitan Lines for Last Quarter of 1917 Show Increases in Cost of Service

With an increase of 4,575,453 revenue car-miles, the electric railways in New York City during the last quarter of 1917 secured a gain of $1,559,629 in railway operating revenues at the cost of a rise of $1,348,520 in operating expenses, as compared to the same period of 1916. After the payment of taxes and contractual and other compulsory deductions from income, the net corporate income showed a loss of $412,298. The Manhattan and Bronx surface lines showed increases in net, but the Queens surface lines and the rapid transit roads reported decreases. Details are published in the accompanying statement. Under the borough totals for surface railways, only a few of the most important lines are included.

FINANCIAL SHOWING OF NEW YORK CITY LINES, OCTOBER-DECEMBER, 1917

Company	Revenue Car-Miles Total	Revenue Car-Miles Increase	Railway Operating Revenues * Amount	Railway Operating Revenues * Increase	Operating Expenses * Amount	Operating Expenses * Increase	Railway Taxes	Net Corporate Income Amount	Net Corporate Income Increase
Hudson & Manhattan Railroad	$2,136,830	$61,301	$1,203,290	$83,979	$532,585	$84,851	$85,160	††$205,826	†$38,876
Interborough { Subway Division	19,359,369	1,194,307	5,948,125	225,779	2,328,824	309,892	569,075	1,724,546	†1,154,568
Interborough { Elevated Division	19,312,427	1,257,847	4,811,081	†99,509	2,519,518	375,228	475,263		
Brooklyn Rapid Transit System	24,087,084	†186,749	7,395,582	88,792	4,714,020	270,256	437,839	378,700	†75,611
Manhattan Surface Roads	10,884,528	1,275,524	5,013,175	979,699	3,451,875	282,702	388,203	†100,934	662,965
New York Railways	6,854,378	343,008	3,020,813	457,004	2,089,220	192,042	238,534	5,795	238,302
Third Avenue (including Kingsbridge)	1,522,941	392,709	1,018,195	267,016	596,551	41,123	75,476	25,290	222,609
Bronx Surface Roads	4,452,021	1,111,753	1,240,427	412,510	969,307	†22,764	91,767	†100,797	394,800
Union (including Bronx Traction)	2,365,156	341,062	674,501	148,497	517,480	†54,099	56,494	†16,528	185,091
Queens Surface (excluding Brooklyn Rapid Transit)	2,371,550	†81,954	511,695	†108,393	576,727	18,848	28,881	†245,204	†131,29
Grand total	$83,447,529	$4,575,453	$26,349,623	$1,559,629	$15,331,299	$1,348,520	$2,095,863	$1,802,810	†$412,298

* No deductions for intercompany transactions. † Deficit, or decrease from corresponding period of 1916. †† Balance applicable to adjustment income bonds.

Portland Earnings Increase

Six-Cent Fare in Oregon City Results in Increase in Receipts and Reduction in Expenses

According to a report submitted to the city council of Portland, Ore., by Edward M. Cousins, public utility expert, the average earnings of the Portland Railway, Light & Power Company for six years ending Dec. 31, 1917, were $919,548 a quarter. In the last six years (twenty-four quarters) the earnings have exceeded $1,000,000 only six times, one of which periods was for the last quarter of 1917. The earnings have never before reached or approached within $100,000 the revenue for the first quarter of 1918, reported now as $1,125,679. Operating expenses show a decrease of $67,126 under the previous quarter. Mr. Cousins says:

"The number of passengers handled during the quarter ended March 31, 1918, decreased 480,451. The latter figure indicates the company is sacrificing business for high rates. There has been a heavy increase in volume of floating traffic in the city due to intensive commercial activity, estimated at at least 25 per cent over the preceding quarter, which should have been reflected in the traffic density.

"It will be recalled that the 6-cent fare took effect on Jan. 15, since which time, as a matter of common knowledge, a large number of car riders under normal conditions have, for of reasons best known to the individuals composing the traffic, the density might easily shrink 25 per cent. At a 6-cent rate 17,022,273 passengers would yield a revenue of $1,021,336. A 25 per cent increase at a 5-cent rate would yield $1,063,892.

"I am satisfied 7,000,000 passengers a month would now be riding on street cars in Portland at a 5-cent fare."

Do Your Duty—and More!

What is one's share of the cost of the war? The Bankers Trust Company, New York, N. Y., has answered this question in a recent pamphlet containing the accompanying table. This table gives a logical basis for determining how much each one should contribute from his income, in the payment of taxes and in the purchase of bonds, so as to bear his equitable share of the cost of the second year of the war.

The distribution of incomes of $3,000 and over is based on 1916 income tax returns, and of those below $3,000 on carefully made estimates. The point particularly to be noticed in a study of the table is the essentiality of every one's doing his share. While a few rich families have large incomes, 75 per cent of the family income is received by those with incomes less than $2,500.

Column I Family Income Group	II Average Family Income	III Percentage Contributable by Each Family	IV Amount Contributable by Each Family	V Number of Families in Group	VI Total Income of Families	VII Total Contributable by Families
Under $850*	$850	9.60	$82	7,288,000*	$4,703,217,000	$102,773,000
$780 — $910	1,000	9.90	[illegible]	3,590,000	3,051,500,000	294,380,000
911 — 1,040	1,100	10.30	113	3,525,000	3,525,000,000	348,975,000
1,041 — 1,170	1,250	10.80	135	2,737,000	3,010,700,000	309,381,000
1,171 — 1,300	1,350	11.20	151	2,262,000	2,827,500,000	305,370,000
1,301 — 1,430	1,500	11.70	175	1,826,000	2,465,100,000	275,726,000
1,431 — 1,560	1,600	12.30	195	1,602,000	2,403,000,000	280,350,000
1,561 — 1,690	1,750	12.60	220	1,228,000	1,964,800,000	239,460,000
1,691 — 1,820	1,950	13.30	251	710,000	1,242,500,000	156,200,000
1,821 — 1,950	2,080	13.50	270	475,000	902,500,000	119,235,000
1,951 — 2,080	2,210	14.00	301	306,000	657,900,000	92,106,000
2,211 — 2,340	2,275	14.60	330	243,000	552,825,000	80,190,000
2,341 — 2,470	2,400	15.00	360	189,000	453,600,000	68,040,000
2,471 — 2,600	2,550	15.40	393	142,000	362,100,000	55,806,000
2,601 — 2,860	2,750	16.10	443	200,000	550,000,000	88,600,000
2,861 — 3,000	3,000	16.90	507	167,000	501,000,000	84,669,000
3,001 — 4,000	3,500	18.80	658	85,000	297,500,000	55,930,000
4,001 — 5,000	4,500	22.40	1,008	72,000	[illegible]	72,576,000
5,001 — 6,000	5,500	25.80	1,419	54,000	286,000,000	73,788,000
6,001 — 7,000	6,500	29.40	1,911	36,500	237,250,000	69,751,000
7,001 — 8,000	7,500	32.80	2,460	26,500	198,750,000	65,190,000
8,001 — 9,000	8,500	36.60	3,094	20,000	170,000,000	61,880,000
9,001 — 10,000	9,500	40.00	3,800	15,500	147,250,000	58,900,000
10,001 — 15,000	12,500	42.00	5,250	45,309	566,362,000	237,872,000
15,001 — 20,000	17,500	45.00	7,870	22,618	395,815,000	178,003,000
20,001 — 25,000	22,500	46.50	10,460	12,953	291,442,000	135,488,000
25,001 — 30,000	27,500	48.00	13,200	8,055	221,512,000	106,326,000
30,001 — 40,000	35,000	51.00	17,850	10,068	352,380,000	179,713,000
40,001 — 50,000	45,000	55.80	25,000	5,611	252,495,000	140,275,000
50,001 — 60,000	55,000	59.10	32,500	3,621	199,155,000	117,682,000
60,001 — 70,000	65,000	61.80	40,000	2,548	165,620,000	101,920,000
70,001 — 80,000	75,000	64.00	48,000	1,787	134,025,000	85,776,000
80,001 — 90,000	85,000	64.70	[illegible]	1,422	[illegible]	78,210,000
90,001 — 100,000	95,000	66.30	63,000	1,074	102,030,000	67,662,000
100,001 — 150,000	123,000	69.10	85,000	2,900	356,700,000	246,500,000
150,001 — 200,000	174,000	71.80	124,400	1,284	223,416,000	159,729,000
200,001 — 250,000	225,000	72.30	162,500	726	163,350,000	117,975,000
250,001 — 300,000	277,000	73.00	202,210	427	118,279,000	86,343,000
300,001 — 400,000	345,000	73.70	254,400	469	161,805,000	119,313,000
400,001 — 500,000	448,000	74.80	333,700	245	109,760,000	81,756,000
500,001 — 1,000,000	683,000	76.20	513,800	376	256,770,000	193,188,000
1,000,001 — 1,500,000	1,106,000	76.66	840,500	97	107,282,000	81,528,000
1,500,001 — 2,000,000	1,701,000	76.70	1,305,500	42	71,442,000	54,831,000
2,000,001 — 3,000,000	2,459,000	77.80	1,905,700	34	83,606,000	64,793,000
3,000,001 — 4,000,000	3,459,000	78.30	2,706,600	14	48,426,000	37,892,000
4,000,001 — 5,000,000	4,514,000	79.00	3,566,000	9	40,626,000	32,004,000
5,000,001 and over	10,284,000	79.70	8,201,500	10	102,840,000	82,015,000
Reported non-taxable incomes not apportioned in reports—50% estimated contributable					2 000,000,000	1 000,000,000
FAMILY GROUPS and individuals—their estimated total incomes and ability to contribute				27,304.199	$38,250,000 000	$7,250,000,000
CORPORATIONS and other business enterprises—their estimated total incomes and ability to contribute after dividend distributions					11,750,000,000	2,750,000,000
Total estimated National Income and amount realizable therefrom					$50,000,000,000	$10,000,000,000
BANKS—the share of the burden which they probably must carry This is not the estimated peak load, but a conservative estimate of the average minimum burden						3,500,000,000
Estimated receipts from direct taxation and bond sales						$13,500,000,000
Estimated receipts from indirect taxes, such as customs, excise taxes, stamp taxes, including sundry receipts						1,500,000,000
Cost of Second Year of the War estimated						$15,000,000,000

*This group is largely composed of individuals

HOW TO USE THE TABLE. Find your income in Column I. Multiply this by the percentage contributable,"—Column III. The result is the total amount which you should contribute during a year. Deduct the amount which you pay in taxes—the remainder is the amount of Liberty Bonds which you should buy from income during a year

Illustration $5,000 income — $5,000 x 22.4% = $1 120 — Less tax, say $80 — Bonds to be bought $1,040

$10,000 income — $10,000 x 40% = $4,000 — Less tax, say $675 — Bonds to be bought $3,325

EACH INDIVIDUAL'S SHARE OF WAR BURDEN

Financial News Notes

Chicago & Interurban Earnings.—The operating revenues of the Chicago & Interurban Traction Company, Chicago, Ill., for the year ended Dec. 31, 1917, amounted to $338,157 as compared to $333,602 the year before. The operating expenses at $212,370 and the interest and taxes at $94,769, however, showed slight increases, so that the net income decreased from $55,565 in 1916 to $31,018 in 1917.

Electric Bond & Share Returns.—The gross income of the Electric Bond & Share Company, New York, N. Y., for the calendar year 1917 totaled $3,140,020, and the net income $2,066,389. The accumulated income, after the payment of $487,710 in preferred dividends and $644,888 in common dividends, was $3,506,204 at the end of the year. The surplus and undivided profit at this time amounted to $4,393,665.

Wants to Fund $182,500 of Notes.—The Springfield Railway & Light Company, which controls the Springfield Consolidated Railway, has asked authority from the Illinois Public Utilities Commission to issue two lots of 5 per cent gold bonds, one for $75,500 and the other for $107,000. The total amount of $182,500 is needed to pay notes issued by the company since Dec. 31, 1913, representing improvements of a permanent nature.

Boise Line Overcomes Deficit.—According to the 1917 report of the controlling companies, the Idaho Power Company and in turn the National Securities Corporation, the gross operating earnings of the Boise Valley Traction Company in 1917 totaled $334,844 as compared to $291,404 in 1916. The operating expenses, including taxes, rose from $215,365 to $234,474. The decrease in other income was offset by the decrease in fixed charges, and the balance for 1917 was a net income of $12,637 as compared to a deficit of $9,804 the year preceding.

Sale Under Foreclosure Ordered.—Supreme Court Justice Greenbaum has appointed Lyttleton Fox referee to sell the franchise and other property of the electric railway running from the East Twenty-third Street ferry to the Christopher Street ferry, which has been owned by the Central Crosstown Railroad, New York City. The sale was ordered in the suit by the Guaranty Trust Company, New York, N. Y., to foreclose on a $3,000,000 mortgage made in 1902 as security for a bond issue. The sum due on the mortgage is $3,545,434. The date of the sale will be fixed by the referee.

Lehigh Preferred Dividend Passed.—The directors of the Lehigh Valley Transit Company, Allentown, Pa., at their meeting on May 16 failed to take action with respect to declaration of the quarterly preferred dividend of 1¼ per cent usually paid early in May. Only 17 per cent of the preferred stock is held outside the Lehigh Power Securities Company treasury. All holders at the time of the recent merger were given opportunity to sell their stock for cash or exchange for securities in the new company. The total issue of Lehigh Valley Transit Company preferred stock is $4,979,687.

Carolina Power & Light Gains 16 Per Cent.—The gross operating earnings of the Carolina Power & Light Company, Raleigh, N. C., and its subsidiaries for the year ended Dec. 31, 1917, totaled $1,826,303 as compared to $1,474,948 in the year preceding. The operating expenses, including taxes, rose from $694,921 to $927,407, and the net income available for dividends in 1917 was $484,972 and in 1916 $351,755. The total number of passengers carried in Raleigh increased from 2,212,162 in 1916 to 2,411,319 in 1917, and those in Asheville increased from 5,165,627 to 5,566,567 in the same period.

Briefs Filed in Seattle Valuation.—Figures of $30,301,404 by the company and $23,179,692 by the city were contained in briefs filed with the State Public Service Commission of Washington and Idaho in the Washington Water Power Company valuation case by Attorney Frank T. Post for the company and Corporation Counsel J. M. Geraghty for the city. The valuation of the power company's property is being made prior to the determination of a basis for future rates. Hearings before the joint commissions were commenced last February and concluded in April. The case was referred to in the ELECTRIC RAILWAY JOURNAL of May 18, page 985.

Another "Dan Patch" Installment Paid.—Representatives of the Dan Patch Patrons' Association have paid C. T. Jaffray, chairman of the committee representing the holders of the bonds of the Minneapolis, Rochester & Dubuque Electric Traction Company (the Dan Patch Air Line), $25,000, the second payment on the electric road. The next payment will be made on July 11. A payment of $10,000 on April 12 resulted in the dismantling order of the Federal Court being held in abeyance. Members of the protective association will pay $225,000 for the part of the road for which they are under contract and will gain title to the property when the payments are completed.

Higher Power Earnings for Kansas Railway.—The Missouri Public Service Commission has granted, in the arbitration requested by the Kansas City Railways and the Kansas City Light & Power Company, an increase in the rate paid by the light company for current from the railway. The rate was formerly 1 cent per kilowatt-hour, but the new rates are $15 per kilowatt of maximum demand and 1.14 cents per kilowatt-hour. This will mean an increase of nearly $500,000 a year in the sum received by the railway. In addition, the commission suggests the payment of $107,481 to the railway to cover the balance up to Jan. 1, 1918, for unadjusted differences in payment for current since the companies were reorganized. The stated sum is the amount to be paid after deducting about $72,000 which the railway owes the light company for fuel oil. The light company is now asking the Public Service Commission for a readjustment of its rates charged to the consumer.

Electric Railway Monthly Earnings

††ATLANTIC SHORE RAILWAY, SANFORD, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr. '18	$14,284	$10,544	$3,740	$473	$3,267
1m., Apr. '17	27,158	23,619	3,539	650	2,889

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., Apr. '18	$1,885,750	$37,254	$1,848,496	$212	$1,848,284
1m., Apr. '17	1,609,012	30,887	1,578,125	225	1,577,900
12m., Apr. '18	20,127,716	380,001	19,747,715	2,635	19,745,080
12m., Apr. '17	14,361,932	278,810	14,083,122	86,511	13,996,611

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

1m., Mar., '18	$245,270	*$179,104	$66,166	$73,881	†$7,715
1m., Mar., '17	236,387	*166,137	70,250	66,629	3,621
12m., Mar., '18	3,077,458	*2,139,882	937,576	836,718	100,858
12m., Mar., '17	2,938,421	*1,869,863	1,068,558	810,460	258,098

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., Mar., '18	$328,221	*$250,282	$77,939	$67,281	$10,658
1m., Mar., '17	287,052	*183,819	103,233	64,662	38,571
12m., Mar., '18	3,783,627	*2,668,891	1,114,736	792,345	322,391
12m., Mar., '17	3,198,789	*1,955,131	1,231,658	760,429	471,229

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$64,766	*$61,072	$3,694	$19,126	†$15,432
1m., Mar., '17	67,227	*53,586	13,641	15,679	†2,038
12m., Mar., '18	868,790	*721,720	147,070	191,057	†43,987
12m., Mar., '17	828,722	*587,706	241,016	186,001	55,015

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

1m., Mar., '18	$481,786	*$347,598	$134,188	$98,128	‡$46,699
1m., Mar., '17	376,822	*245,765	131,057	78,347	‡53,842
12m., Mar., '18	5,207,284	*3,617,494	1,584,790	1,055,564	‡623,535
12m., Mar., '17	4,143,045	*2,514,630	1,628,415	868,735	‡778,566

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

12m., Mar. '18	$6,559,130	$4,191,939	$2,367,191	$1,013,507	$1,353,684
12m., Mar. '17	5,543,778	3,043,414	2,500,364	914,551	1,585,813

* Includes taxes † Deficit ‡ Includes non-operating income

†† On May 1, 1917, the Atlantic Shore Railway was divided East and West of York Beach, Me., the Western end passing to the operating control of the Portsmouth, Dover & York Street Railway. Figures for the first four months of 1917 are for the entire system. Beginning with May 1 figures for the Atlantic Shore Railway as at present constituted are given.

Traffic and Transportation

Fares Up from Six to Seven Cents

Hartford & Springfield Street Railway Advances Zone Fares Another Cent, with Fifteen Rides for $1

The Hartford & Springfield Street Railway, Warehouse Point, Conn., announced an increase in fare from 6 cents to 7 cents in the zones operated by the company in Connecticut, effective on May 20.

At a public meeting in Thompsonville on May 13, George S. West, treasurer of the road, discussed the necessity for the increase. He stated that the company was not earning its interest charges at present and that no dividends had been paid on the common stock since the first year of operation. Unless net earnings could be materially increased a receivership was likely, with the probability of the road being sold for junk at a price which it is estimated will return 50 or 60 per cent of the investment to the owners. From 1901 to 1908 only about 6 per cent was paid on the preferred stock; from 1908 to 1912 less than 3 per cent, and since 1912 nothing has been paid.

The company operates about 48 miles of track. In 1917 an inventory by Sloan, Huddle, Feustel & Freeman, Boston, showed a total value of $1,290,125, based on the prices of normal times. The road is bonded for only $20,000 per mile, and its capitalization includes $285,000 of preferred stock and $500,000 of common. Mr. West said that the cost of material had increased 140 per cent within a comparatively short period; that wages were lower than on most other roads, and that these will probably be increased after June 1, when the existing agreement with the men expires. A high tribute was paid by the speaker to the loyalty of the employees, who have faithfully remained at their posts in the face of the rising cost of living and of superior opportunities elsewhere. The total cost of fuel for the year ended April 30, 1918, was $43,702, compared with $24,423 the previous year. Operating results for the 1917-1918 fiscal year were: Gross earnings, $240,608; operating expenses and taxes, $210,912; net earnings, $29,696; interest, $45,950. The total deficit was $26,085.

The company has arranged to sell books of tickets at the rate of fifteen rides for $1.

"Key System News" Popular

The San Francisco-Oakland Terminal Railways, Oakland, Cal., at present is distributing approximately 80,000 of each issue of *Key System News*. Of this number more than 35,000 are distributed through the mails to a list compiled from the telephone book, lists of club members, both gentlemen's and ladies' clubs, city directories, fraternal organizations, etc., and by personal canvass of the homes of working people whose names do not appear in the telephone directory. The paper is mailed direct to residences and not to offices.

In addition to those sent by mail, the company also carries supplies of copies in two tin boxes, one at each end of the cars. In that manner it disposes of about 40,000 copies. *Key System News* is regarded as having been of great help in educating the people of the communities that are served by the railway to a better idea of the business of the company and to the problems of increasing costs for labor and material.

London Fare Increase Refused

The request of the London (Ont.) Street Railway for a fare increase has been rejected by the City Council by the adoption of the recommendation of the finance committee and board of control "that no action be taken on the request . . . at present."

Meanwhile the employees have refused anything less than the 30 per cent wage increase which they demanded. As a result the question has gone to a board of concilation, appointed under the industrial disputes act.

The company put forward a proposal that the city should have a measure of control and also jurisdiction over the expenditure of all earnings in excess of 6 per cent on its stock issue. Figures were presented showing that there was an actual deficit last year of $24,827, with capital obligations fully met. The company's franchise expires in 1925. The dividend on stock actually was paid in the first half of the year, but was passed in the second half.

Mayor Somerville suggested that the company arrange to discontinue temporarily its annual redemption of $35,000 of bonds, paying interest meanwhile on a sort of patched up moratorium.

Last year 7,976,239 people were carried on seven-for-25-cent tickets, 1,553,099 on limited nine-for-25-cent tickets, 268,574 on two-for-5-cent child's tickets and 1,091,836 on 5-cent cash fares. The average fare per passenger was 3.63 cents.

The company has not yet availed itself of its right of appeal to the Ontario Railway & Municipal Board. It is practically certain that the question will be reopened later in the year, when the new wages are in operation.

The company carried on a vigorous advertising campaign, and it is believed that an effective groundwork has been laid for future action.

Trenton Fare and Service Cases

Former Will Be Begun on June 3 Following Conclusion of Inquiry Into Service and Equipment

The Board of Public Utility Commissioners of New Jersey decided on May 14 to start the hearing on June 3 on the application of the Trenton & Mercer County Traction Corporation for 6-cent fares.

At present hearings are being held before the commission on complaint of the City Commission, in which poor service is alleged. After the cross-examination in the pending service improvement is completed the hearing will be resumed on May 28, and this will allow the Utility Commission time to prepare for the rate hearing.

H. C. Eddy, senior inspector of traffic for the Utility Commission, testified that he did not think one-man cars would be advisable for Trenton. He produced cards taken from three-day readings during the rush hours showing that not enough cars were in service to handle the crowds. He thought that the riding habit in Trenton was not as strong as in other cities. Mr. Eddy said the company needed a dispatching system to improve its service.

Many recommendations for improvement to its lines were made at the hearing of the Trenton & Mercer County Traction Corporation before the commissioners on May 15. F. J. Daly, an inspector for the board, who made a complete survey of Trenton, was assisted by five trained traffic observers. Mr. Daly said the company did not provide ample service during the rush hours, especially to the men and women employed in the factories. He said that two of the faults were the failure to maintain schedules and the operation of single-truck cars.

That the carhouses of the corporation should be removed from their present location to some site more central in order to be more accessible for the cars and get them promptly in service was one of the recommendations of Chief Inspector Eddy of the commission. Mr. Eddy presented a detailed statement of defects in cars and tracks on the Trenton road. He said the fire protection at the carhouses is not adequate and he recommended an automatic sprinkling system over all the structures. He also suggested a reorganization as far as the corporate existence and the operating department were concerned. He thought that all the single-truck cars should be replaced with double-truck cars.

The hearing was before Commissioners Donges and March. George L. Record, special counsel, and Charles E. Bird, city counsel, represented Trenton. Former Prosecutor Martin P. Devlin appeared for the labor interests, and Frank S. Katzenbach, Jr., and Joseph E. Hunt, together with Rankin Johnson, president of the traction company, were present on behalf of the company.

Pittsburgh to Zone

Receivers Realize Inadequacy of Recently Increased Flat Fare to Meet the Present Conditions

The receivers of the Pittsburgh (Pa.) Railways after an examination of the revenues, expenditures and financial needs of the company, have come to the conclusion that it is absolutely imperative that the revenues be increased in order that proper service may be maintained and that adequate provision be made for the immediate future.

A statement by the receivers says:

"Our examination indicates that a fare of from 7 to 8 cents will be necessary to take care of the things that must be done to render the service that should be rendered, but we hope that we will be able to find a way to establish an area in the downtown section where a lower rate than this will be sufficient. As soon as we arrive at a definite conclusion with regard to the actual necessities and to our plans to overcome those difficulties we will make public the details."

In discussing the announcement, Attorney Charles A. Fagan, one of the receivers, said he did not believe there would be any widespread opposition to the proposed plan once it was fully understood and the equitable treatment it would afford the people was appreciated. He is quoted as follows:

"I do not think the proposed plan will be considered unjust or burdensome when all the points are announced and its workings are understood. That announcement, I may say, will come very soon; the matter is virtually decided upon now.

"The zone plan, or the paying by the passenger for the ride according to the distance traveled, is the only logical method. There is no reason why one person should pay as much for riding a short distance as another does for riding several miles. There will be a lowering of the present rate of fares in many instances. Some of those who travel will go back to the old 5-cent fare. I think the public will come to see that the plan is the right one and should have been effective long ago."

Fare Increase for Atlantic City Road

The State Board of Public Utility Commissioners of New Jersey has allowed an increase in fares for the Atlantic City & Shore Railroad. Two cents has been added to the rate between Atlantic City and Pleasantville. Other zones in which the company operates are affected at the rate of 1 cent for each fare collected. The company will continue to sell strip tickets at six for 60 cents. This the board says will result in a 5-cent fare for patrons. It is further stated by the board that the increase appears to be a reasonable means of securing added revenue for the company, and that it is estimated the raise in fares, will result in an increase of $20,058 for the company.

A hearing on the application for the increase was held on May 13. No opposition was registered. The board was of the opinion that if the operation of the road was to be continued, additional revenue must be afforded and that it did not seem to be unreasonable to expect that the division could yield such revenue. The increase is to take effect at once.

I. T. S. Increases Allowed

In an order effective from May 1, the Public Service Commission of Illinois has granted almost in its entirety the petition of the Illinois Traction System, Peoria, for emergency relief for electric light and gas plants in fourteen Illinois cities where it operates.

The commission also allows 6-cent fares in Cairo and Jacksonville and the elimination of tickets and straight 5-cent fares in Bloomington, Decatur, Danville, Champaign, Urbana, Galesburg and Quincy. Increases in rates for gas ranging from 10 to 25 cents a thousand are allowed in Decatur, Danville, Champaign, Urbana, Galesburg and Jacksonville. Electric rate increases of approximately 1 cent a kilowatt-hour are allowed in Bloomington, Galesburg, Normal, Decatur, Danville and Jacksonville, while smaller increases are allowed in Cairo and cities in which the Madison County Light & Power Company operates.

The order in brief says that this is an emergency case and that it is the duty of the commission in each instance to determine what may be reasonable rates for the public and the utility alike.

The new rates are not to remain in effect beyond six months after the termination of the war and may be rescinded before that time. If the commission decrees, the old rates automatically become effective. The companies are to file reports of earnings and expenses every six months.

Boston Will Eliminate 1152 Stops

The Boston (Mass.) Elevated Railway is planning to eliminate 1152 stopping places on its surface lines for the purpose of saving coal as recently recommended by James J. Storrow, New England Fuel Administrator. There are 2881 stopping places on the surface lines less than 500 ft. apart, and 1200 of these are less than 400 ft. apart. Forty per cent of these, or 1152, can be withdrawn and it is estimated that this will save 27,000 tons of coal in one year, or about enough fuel to operate the road for twenty-seven days in the winter. Bulletins emphasizing the above facts have been posted in the various subway stations, carhouses, etc., on the system. They are signed by Edward Dana, transportation manager. These bulletins also urge the co-operation of the public as follows:

"Twenty-seven thousand tons of coal saved during the coming year will operate the road for approximately twenty-seven days next winter, when it may be impossible to get coal.

"As a war obligation the co-operation of patrons is solicited."

Rigid Parking Rules

At Some Corners in Washington Autos Not Permitted to Cross Tracks Except at Night

The district commissioners of the District of Columbia, supplemented by the police department, have just announced a series of new traffic rules which will go into effect on June 1. Their purpose is still further to help car movement which has already been assisted by the skip-stop, staggered-hour program, introduced in Washington by the commission. The section bounded by I Street, Pennsylvania Avenue, Seventh Street and Seventeenth Street is defined as the congested section, and most of the new regulations apply to it.

No Left-Hand Turns

The two most radical changes forbid left-hand turns at Fifteenth Street, New York and Pennsylvania Avenues and Fourteenth Street and New York Avenue and establish a number of one-way streets. At Fifteenth Street and New York Avenue vehicles are forbidden to cross the car tracks at all. Where there is a street loading platform or safety zone, no vehicle may stand between the platform or zone at the curb except long enough to take on or let off passengers. On several streets no parking of automobiles or other vehicles is permitted; on other streets parking is allowed for a limited time only.

Reduction in Fare Refused

The State Board of Public Utilities Commissioners of New Jersey has dismissed the petition of the city of Hoboken, filed on March 26, 1913, asking that the fare of the Public Service Railway there be reduced from 5 cents to 3 cents. The original petition applied to the Washington Street and the Willow Street lines, but on Oct. 1, 1915, an amended petition was filed making the petition applicable also to other lines in the city.

The petition alleged that the 5-cent rate of fare was unjust and unreasonable and that a 3-cent rate would be just and reasonable. After declaring that the city of Hoboken failed to sustain its allegations, the report of the Board of Public Utility Commissioners says:

"A satisfactory conclusion, even after a complete anaylsis of the testimony is impossible because of the confused state in which it was presented. Much of the testimony offered by various witnesses was subsequently withdrawn because of inaccuracy. Many of the elements necessary to a proper appraisal were disregarded and it would seem that no genuine attempt had been made by any of the witnesses to ascertain any proper allocation of the passengers, revenue therefrom, or operating expenses to the city of Hoboken which would justify the board in making any determination as to the merits of the application."

Charlotteville's Fare Increase Carried Unanimously

The Value of Good Public Relations in a Pinch Is Demonstrated Again in Virginia's University City

In securing the right to charge a straight 5-cent fare and a straight 3-cent children's fare in place of the six-for-a-quarter and two-for-five tickets, noted briefly in the ELECTRIC RAILWAY JOURNAL for April 27, page 831, the Charlottesville & Albemarle Railway, Charlottesville, Va., did not have to depart from its unique position as "an electric railway without an attorney." The local franchise did not embody any restrictions on rates of fare other than that the maximum within the city limits must not exceed 5 cents and without the city limits, 10 cents. The grant did require, however, that if any change was desired formal advertisement must be carried four times and that application for a hearing must be made before the State Corporation Commission with submission of valuation figures and other evidence of conditions.

FORMAL AND INFORMAL NOTICES

In compliance with the law, the railway, which was described in this paper for Sept. 22, 1917, inserted the usual formal notice on April 1, 4, 8 and 11.

Please Note

On account of the great increase in the cost of labor, rails, copper wire, in fact everything used in the operation of a street railway, we shall be compelled to discontinue on March 1st, 1918, the sale of six tickets for a quarter, having a straight five-cent fare; while for children between five and thirteen years of age tickets will be sold at the different stores, and at the Company's Office, at three cents each.

We regret very much the necessity for this action, but it is in order to maintain the service and help pay expenses. Tickets will be on sale until March 1st.

C. & A. RY. CO.

NOTICE OF INCREASE

The informal notice, however, appeared during the last few days of February both as a newspaper advertisement and a car poster. This notice, reproduced herewith, begins with a "Please Note," and the general tone is one of regret that an increase is necessary to maintain the quality of the service. To give the public a breathing spell, the company announced that tickets could still be bought at the old rates up to March 1. This brought a veritable avalanche of ticket sales, fully $2,000 of tickets being sold within ten days on a property whose total railway income during the entire year 1917 was only $42,605.

In the meantime, formal hearing before the State Corporation Commission had to be delayed until April 15. Pending this hearing, the company stopped selling tickets on the cars after March 1. Of course, it was still possible for a person to buy tickets at the old price by going to the office of the company, but very few took advantage of this opportunity.

At the hearing before the commission, the company was represented only by John L. Livers, its vice-president and general manager. The application was granted without any opposition, either from the Charlottesville Council or the Chamber of Commerce. Everybody felt the company was entitled to any increase that it needed to maintain its high standard of service.

Perhaps this quotation from an editorial entitled "A Fair Rate," in the Charlottesville *Daily Progress* is as good a picture as any of the public frame of mind:

"Charlottesville can boast the best street railway service of any city of equal size in this country. It has attracted favorable comment from many strangers who are surprised to find such a modern and splendidly equipped street railway in a city no larger than Charlottesville. To continue to maintain this up-to-date system, the company finds it imperative to discontinue the sale of six tickets for 25 cents."

The editorial then listed a large number of places that had gone to 6 and 7-cent fares whereas Charlottesville was simply going to the 5-cent fare.

Mr. Livers figures that the 5-cent full fare and 3-cent half-fare will add about $3,550 to the annual revenue, assuming that the travel for 1918 equals that of 1917 when the receipts were $42,605. It will not be easy to keep this volume of traffic because the war has cut down the attendance at the University of Virginia from 1200 to 600 students. At the same time, the company is certain that not a fare will be lost because of the increase. The discontinuance of tickets will also save several hundred dollars in printing and accounting charges, besides simplifying the work and eliminating temptation for the car operators.

Municipal Railway Feels the Pinch

The proposed amendment to the charter of the city of Edmonton, Alta., authorizing it to collect fares on the Edmonton Municipal Street Railway on the straight zone principle, was not authorized by the Alberta Legislature but the following section was adopted:

"Notwithstanding anything to the contrary whatsoever, the city is hereby declared to have and it shall have the power and authority to charge such tolls and fares on its tramway lines as shall from time to time be fixed by its Council, provided that such fares are uniform throughout the city."

Acting on the new powers, the city's street railway committee made the following recommendations:

"Transfers to be issued only between 6 and 9 a. m. and 5 and 8 p. m. A 10-cent fare between 11.15 p.m. and the time when cars cease running at night. Six tickets for 25 cents, good between 5 and 8 a.m. School children, ten tickets for 25 cents. Street railway to be supplied with electric energy at cost. Otherwise the 5-cent fare to remain in force as before."

An alternative proposal was submitted by Alderman Martin. He suggested the following:

Children 2½ cents, but such tickets not to be used between 9.30 and 11.15 a.m., and after 5 p.m. Labor tickets 4 1/6 cents, or six for 25 cents. Ordinary tickets, 6¼ cents—that is, four for 25 cents, or cash fares 7 cents. Ten-cent fares after 11.15 p.m.

Further discussion of the matter was adjourned until the new legislation becomes operative.

Report on Transportation in Washington

The report of the Public Utilities Commission of the District of Columbia to the Senate on March 9 relative to transportation conditions in Washington has just been published as document 197 of the Sixty-fifth Congress, Second Session, Senate. It contains sections 1 to 5 of the report made by John A. Beeler, the commission's expert, on congestion in the throat of the Capital Traction System, stopping places, entrance to Washington, of the W., B. & A. interurban cars, staggered hours of business and congestion on the downtown business district lines of the Washington Railway & Electric Company. The commission says in its report that it is still studying the question of rerouting and believes that it has full power, under the public utilities act, to take all necessary steps to carry out such improvements.

Salt Lake Fare Decision Upheld

By a decision of the Supreme Court of Utah Salt Lake City loses its fight for the 4-cent fare on the lines of the Utah Light & Traction Company.

The Public Utilities Commission ruled some time ago that the company's application for the elimination of the commutation books, giving fifty fares for $2, be granted. As a result the selling of the tickets at the 4-cent rate was discontinued on Dec. 31 last, and the company declined to accept any of the tickets after Feb. 1. Appeal from the commission's decision was taken by Salt Lake City.

The decision of the Supreme Court says that the order of the commission increasing the fares, presented three questions:

1. Did the passing of the franchise ordinances fixing the fares and their ecceptance by the defendant constitute a contract between Salt Lake City and the defendant and between Murray City and the defendant?

2. If the franchise ordinance constituted contracts, was it within the power of the Legislature to authorize the commission to change the fares?

3. Does the constitutional provision by which the city authorities are given the exclusive right to permit or to refuse permission to electric railway companies to construct and operate within the cities of the State, prevent the State through its Legislature, from exercising its sovereign perogative to regulate and change the fares fixed in the franchise ordinances?

The first and second questions are answered in the affirmative by the Supreme Court. The third is answered in the negative. The court holds that so far as the question of the powers of the Utilities Commission are judicial, the utilities act has conferred power upon the Supreme Court; but in so far as the acts of the commission are properly administrative, or in their nature legislative, the power has been "wisely and properly" withheld from the court.

The decision of the Public Utilities Commission in this case was reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 16, page 34.

Cleveland Body Will Investigate

The public utilities committee of the Chamber of Commerce of Cleveland, Ohio, is preparing to investigate the electric railway situation in brder to ascertain whether the 6 per cent dividends, pledged by the Tayler grant to the Cleveland Railway, can be maintained and at the same time adequate service be furnished. This was decided at a meeting held on May 13. The work will be commenced just as soon as the personnel of a committee can be decided. Mayor Harry L. Davis, Street Railway Commissioner Sanders and members of the Council committee on street railways will be invited to participate.

Attorney H. J. Crawford, representing the company, said that Council must either allow the maximum fare provided by the franchise to be exceeded, or the service will have to be reduced. A clause in the grant provides for a reduction of service, if at any time the income is insufficient to pay the expenses of operation and, also, yield a return of 6 per cent on the investment, as represented by the outstanding stock.

Mr. Crawford said that the safeguards about owners of the stock are so strong that whenever the dividend rate is impaired the city will lose control of the operation of the road and the authority of the Street Railway Commissioner will be nullified temporarily. However, before the city would lose this control, arbitrators would have to ascertain that the service demands were too great to enable the company to meet its requirements at the maximum rate of fare and fix the method in which the company was to recoup its losses.

J. J. Stanley, president of the Cleveland Railway, expressed the hope that it would not be necessary to reduce the service. It is barely sufficient now to take care of the transportation needs of the city.

Within the past year the rate of fare has been increased four times.

Philadelphia Rapid Transit Wants Six-Cent Fare

Additional Revenue Imperative in Philadelphia if Ability to Serve Public Is to Continue Unimpaired

Mayor Smith of Philadelphia, Pa., on May 16 submitted to Councils a communication from the Philadelphia Rapid Transit Company, asking for an increase in fares from 5 cents to 6 cents.

The bill has in turn been referred to Councils' committee on finance and to the street railway committee. The measure provides that in case the transit lease now before the Public Service Commission is approved, the base fare shall be 6 cents, and the fare thereafter shall be subject to adjustment according to the terms of the lease. If the lease is not approved, the measure provides, the 6-cent fare shall be subject to revision and adjustment at the expiration of one year after the close of the war.

Thomas E. Mitten, president of the Philadelphia Rapid Transit Company, in a letter to Mayor Smith and Councils, said in part:

INCREASE A WAR MEASURE

"Apart from all other considerations, and purely as a war measure, the company, therefore, at the instance of its men and in order to be in a position to render more efficient service, asks you to assent under the 1907 contract to an increase in the base fare from 5 cents to 6 cents. It is estimated that this increase, after allowing for a slight falling off in riding, will add $3,500,000 to $4,000,000 to the revenues of the coming year, all of which will be expended in the payment of the increased wages and in the purchase of new cars, and other facilities and the improvement of service to the public. The company will immediately, upon assent being granted, place orders for 100 additional cars, and believes that it can get the necessary priority orders to have them delivered within a period of six months, so that if ordered promptly they will be available for the next winter.

"The company pledges that no part of the increased revenue derived from the increase of fare asked for shall be used to pay dividends to the stockholders of the company beyond the 5 per cent now established.

"The financial results for the year ended June 30, 1918 (two months estimated), will be as follows:

Gross earnings	$30,343,000
Operation and taxes	18,337,000
Fixed charges and dividends	11,253,000
Surplus	753,000

"An estimate of the results for the year beginning July 1, 1918, assuming a 4 per cent increase in gross earnings, an added payroll charge of $1,750,000 on account of a 5 per cent increase in wage and with allowance for increase in the cost of materials and other expenses, follows:

Gross earnings	$31,560,000
Operation and taxes	21,761,000
Fixed charges and dividends	11,350,000
Deficit	1,551,000

"Applying this estimate of earnings for the fiscal year beginning July 1, 1918, to the estimated working cash balance on hand June 30, 1918, and having regard to the fact that all capital expenditures, including refunding, must be met out of current cash, as it is impossible to issue any new securities during the war period, the financial condition of the company as at June 30, 1919, would be as follows, no allowance being made for increase in fare:

Estimated cash working balance June 30, 1918	$1,900,000
Year to June 30, 1919, deficit from operations	1,551,000
	$3,490,000
Capital requirements	1,800,000
Estimated cash deficit June 30, 1919	$1,451,000

"If the fare increase asked for should become effective, say, July 1, the estimated increase in gross revenues for the coming year would be $3,500,000, from which should be deducted the above estimated cash deficit of $1,451,000, leaving $2,049,000 cash available for the purchase of 100 new cars and the improved service facilities promised. If the result of the fare increase should be more favorable than the estimates, the additional revenues would also be applied to the extension and betterment of the service."

Dallas Jitneys Lose

Jitney drivers of Dallas, Tex., lost again in the recent city election in which they sought by initiative to validate the initiated ordinance adopted by the voters at a general election more than one year ago and later held invalid by the courts. The jitney drivers by an initiative petition at the recent city election sought to make certain changes in this measure which would have removed the objections raised to it and would have made the measure conform to the court's interpretation of the constitutional limitations on these points. The initiated measure was overwhelmingly defeated.

With the results of the recent election announced, A. S. Hardwicke, city attorney, has issued a statement outlining in full the city's attitude toward the jitneys in Dallas. Mr. Hardwicke reviewed the fight between the city and the jitney drivers from the beginning, showing how the city first enacted a simple regulatory ordinance, the provisions of which were not onerous, but that the jitney drivers objected to any form of regulation and went to the courts and secured an injunction nullifying the action of the city. This case has been appealed by the city and is now before the State Supreme Court.

With the situation thus disposed of for the time being, at least, city authorities have issued instructions to the police department to enforce the jitney regulations to the letter. This enforcement has practically put the jitneys out of business in Dallas.

Transportation News Notes

Metal Tokens for St. Louis.—Metal tickets will be used by the United Railways, St. Louis, Mo., when the new 6-cent rate is applied on June 1.

Six-Cent Fare in Chester.—Notice was given on May 15 by the Southern Pennsylvania Traction Company, Chester, Pa., that a new tariff for fares would go into effect on June 14. The increase is from 5 cents to 6 cents.

Increase for West Virginia Line.—The Newell Bridge & Railway Company, Newell, W. Va., has been authorized to increase its fare on the Newell-East Liverpool line from 5 cents to 10 cents, effective at once.

Skip Stop Suggested for Twin Cities.—The skip-stop plan of operation for the Twin City Rapid Transit Company has been suggested to the Councils of Minneapolis and St. Paul, Minn., and will receive attention at once, it is expected.

Maine Road Files Increase.—The Calais (Me.) Street Railway on May 18 filed a new schedule of fares with the Public Utilities Commission of Maine proposing an increase in fares from 5 cents to 6 cents, effective on June 10.

Commission Refuses Fare Increase to Interurban.—The Public Utilities Commission of Colorado has refused the application of the Denver & Interurban Railroad for permission to increase the fare between Denver and Boulder from 75 cents to 90 cents for the 28½-mile trip.

Springfield Wants Six-Cent Fare.—The Springfield (Ill.) Consolidated Railway has filed a petition with the State Public Utilities Commission asking for authority to increase its rates from 5 cents to 6 cents, and to discontinue selling tickets for reduced prices, as at present.

Omaha Would Charge Six Cents.—The Omaha & Council Bluffs Street Railway has filed a petition with the State Railway Commission of Nebraska for permission to increase its fares in Omaha from 5 cents to 6 cents. The purpose of the company to do this was noted briefly in the ELECTRIC RAILWAY JOURNAL of May 18.

Will Go to Seven Cents.—It is reported that the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, will file with the Public Service Commission of Pennsylvania a new tariff increasing car fares to 7 cents or six tickets for 40 cents in the Sharon-Farrell district, which includes Wheatland, Farrell, Sharon and Sharpsville.

Cincinnati Must Be Shown.—W. C. Culkins, street railroad director of Cincinnati, Ohio, is quoted as saying that an increase in the rate of fare will be considered only after all other remedies for improving the financial situation of the Cincinnati Traction Company have been exhausted. He considers that the burden of proof rests with the company.

Elevated Skip Stops.—Patrons of the Ravenswood branch of the Northwestern Elevated Railroad, Chicago, Ill., were recently notified that to shorten the running time between their stations and the downtown loop, commencing May 13 and until further notice a skip-stop train schedule would be put into operation on the Ravenswood branch during the morning rush hours.

Would Compel Company to Pave.—Judge King Dykeman, in the King County Superior Court, Seattle, Wash., recently signed the order for peremptory writ compelling the Puget Sound Traction, Light & Power Company to proceed with the paving in the Queen Anne District, as obligated in its franchise. It is understood the company will file a supersedeas bond pending appeal.

Twin City to Ask Six-Cent Fare.—Horace Lowry, president of the Twin City Rapid Transit Company, Minneapolis, Minn., speaking on May 17 before the St. Anthony Commercial Club, said the company is preparing a request to the City Council for permission to put in a 6-cent fare. According to Mr. Lowry the company is facing higher fare, curtailment of service or bankruptcy. The proposed move is a war measure.

Final Schedule Order Issued.—The Public Service Commission for the First District of New York has adopted a final order directing the Brooklyn Heights Railroad and other companies of the Brooklyn Rapid Transit System operating surface car lines, to file operating schedules with the commission and to post in the cars placards giving the "headway" and service called for in the schedule. These schedules must show the route, the car run numbers, the terminals and car depots.

P. A. Y. E. Extended in Spokane.—On May 5 the Spokane (Wash.) Traction Company inaugurated the system of pay-as-you-enter on all of its cars. This plan of operation has been in use on the Washington Water Power Company cars for a couple of years. The Spokane Traction Company is planning to change its gates both of which are at the rear end of the car opening out on the right side and operated by the motorman. When the change is made it will be possible for the conductor to operate the gates.

Blue Hill Street Railway Seeks Fare Increase.—The Blue Hill Street Railway, one of the original Stone & Webster properties south of Boston, Mass., has filed a schedule of increased fares with the Public Service Commission of Massachusetts. The road at present is operated in three zones of 5-cent fares each and in one 6-cent zone. It is proposed to increase the fare to 6 cents in each of the former 5-cent zones and to 7 cents in the former 6-cent zone. A public hearing will be assigned by the board at a later date.

Seattle Suburban Line Feels Pinch.—Thomas F. Murphine, city utilities commissioner of Seattle, Wash., has agreed to the request of a delegation from the Rainier Valley Business Men's Club to investigate the Seattle & Rainier Valley Railway. The club committee presented no definite plan or recommendation. It asked that the city extend some relief to the road. The elimination of transfers, the sale of block tickets and a 6-cent fare have all been advanced as relief measures, although the 6-cent fare seems hardly possible in view of the recent court ruling.

Dayton Has a Traffic Problem.—A. L. Drum, transportation engineer of the United States Shipping Board, addressed electric railway officials and members of the City Commission at Dayton, Ohio, on May 8 in an effort to offer suggestions that will aid in the solution of the transportation problem in that city. Mr. Drum suggested that factories stagger the hours for opening and closing and that cars be rerouted. The matter is now before the Commissioners and J. E. Barlow, city manager, and an effort will be made to work out a practical plan.

Voters to Pass on Fare Increase.—A resolution has been passed by the City Commission of Sioux Falls, S. D., to submit the question of a 6-cent fare for the Sioux Falls Traction System to the voters and a special election has been called for May 28. Several weeks ago a committee of members of the local commercial club and other citizens was appointed to investigate the affairs of the company. On May 11 that body filed a report in which it recommended a 6-cent fare. Among other things the committee learned that the railway has paid no dividend on its stock since 1907 and that for the last three years the expenditures of the company have exceeded the receipts.

Increase for Trenton Suburban Line.—An increase from 5 cents to 6 cents on each fare and the withdrawal of commutation tickets at twelve for $1 was allowed on May 17 to the New Jersey & Pennsylvania Traction Company on its lines in four fare zones between Trenton and Princeton by the State Board of Public Utility Commissioners. The board says the increase is for the purpose of meeting a deficiency in operating revenue and to provide for the bond interest and not for the purpose of declaring dividends, and that the addition of 1 cent to each fare and the withdrawal of tickets will net the company 6 per cent on the physical value of the property.

Charleston Refuses Fare Request.—By a vote of nine to eight the City Council of Charleston, S. C., on May 14 rejected the petition of the Charleston Consolidated Railway & Lighting Company asking for an increase in fare from 5 cents to 6 cents. When the matter was officially reported to the Alder-

men, Chairman Lawrence M. Pinckney, of the joint committee on ways and means, streets and railroads, first read the majority report, which favored an increase, and then the minority report, signed by five members, which opposed the granting of the petition. Alderman Pinckney moved that the minority report be considered as a substitute for the majority report after Alderman Robertson had moved for adoption of the majority report.

A Red Cross Car.—W. W. Lowe, manager of the Manhattan & Queens Traction Corporation, New York, N. Y., is preparing a car for the Red Cross campaign. The exterior and interior will be entirely in white enamel, with large red crosses prominently displayed. In this case the motorman will wear the costume of a surgeon, while the conductoress will represent a Red Cross nurse. Mr. Lowe is contemplating offering an annual pass over the railway to the passenger making the largest subscription. The car of this company which has been enlisted in the Thrift Stamp campaign was described and illustrated in the ELECTRIC RAILWAY JOURNAL of May 18, page 991.

Wants Straight Five-Cent Fare.—The Des Moines (Ia.) City Railway has started a newspaper advertising campaign as a forerunner of its plan to put fares in Des Moines on a straight 5-cent basis. Several times recently all the papers in the city have carried half page advertisements which give a very concise financial statement of the company's revenues and expenses during the first three months of 1918. Particular attention was called to the fact that the expenses during this period exceeded the income by more than $4,000. There is likelihood now that the City Railway will ask the Council to suspend the six-for-a-quarter ticket clause of the franchise during the period of the war. Officials of the company are of the opinion that the city can take this action without a vote of the people which would be necessary if an unqualified 5-cent fare were sought.

A Runaway.—A curious runaway occurred recently on an electric railway in one of the Central States. The primary cause was that the trolley jumped off on a small pay-as-you-enter car which, at the time, was on the out trip near the edge of the city. The motorman-conductor got off to put the trolley back. When the trolley struck the wire, the car started down the track for the country. The motorman was too surprised to hang to the trolley rope. He had left his controller on the first contact. Since the car was on a 12-mile interurban track and would soon meet a big interurban car, the motorman hurried to the dispatch phone and explained the situation. Power was cut off at once. The motorman walked 4 miles to get his car and then a mile to a station phone to call for power again. His carelessness had tied up the interurban and freight service of a busy railroad line for two hours.

Legal Notes

ILLINOIS.—*Interurban Motorman While on City Tracks Is Employee of Interurban Company Under Workman's Compensation Act.*

Under the workmen's compensation act, a motorman employed by an interurban railway company and wearing its uniform, who was paid by the hour and operated its cars to the city limits of Chicago and then operated them within the city limits under an agreement between the interurban company and a city railway company, whereby that company paid his wages while operating within the city, was the employee of the interurban company while operating cars within the city. (Chicago & Interurban Traction Co. *vs.* Industrial Board of Illinois et al., 118 Northeastern Rep., 464.)

ILLINOIS. — *Assessment of Railway Buildings for Municipal Benefits.*

Where the real estate on which an electric railway terminal is located is assessed for improvements and the use of such terminal for railway purposes is permanent, the property should not be assessed on the theory that the company might sell it for a manufacturing plant and move its terminal to some other place. (City of Chicago *vs.* Chicago Railways, 118 Northeastern Rep., 728.)

MASSACHUSETTS. — *Release by Injured Passenger Does Not Affect Executor's Right of Action.*

Where an injured passenger gave a street railway a release from any and all claims, demands, actions and causes of action of every name and nature that she had or might have against the company as a result of her injuries, the release to be binding on her, her heirs, executors, administrators and assigns, such release did not bar recovery in the executor's action for wrongful death of the passenger caused by her injuries, since, in case of recovery for wrongful death, the executor or administrator receives the penalty for death in a different capacity from that in which he would receive damages for conscious suffering. (Wall *vs.* Massachusetts Northeastern Railway, 118 Northeastern Rep., 864.)

NEW JERSEY.—*Person Crossing Track Must Exercise Continual Vigilance.*

The plaintiff before crossing the track of a street railway looked first to the south and then to the north, and continued looking to the north until a car coming from the south came into the range of observation, but he did not look again to the south before attempting to cross. He was struck and injured by the car which was moving from 5 to 8 m.p.h. It was held to be a court question and not a jury question, that the plaintiff was guilty of contributory negligence and that it was error for the trial court not to have granted a motion to nonsuit the plaintiff or direct a verdict for the defendant. (Hubbard *vs.* Atlantic Coast Electric Railway, 102 Atlantic Rep., 632.)

NEW JERSEY. — *Proper Service with Maintained Property More Important than Contracts with Municipalities.*

Where a street railway was being run at a loss, even without allowing for depreciation, the public utility commissioners should have granted a request to raise the fare from 5 to 6 cents, although there were local contracts with municipalities through which the road ran, such contracts being inferior to the duty of the street railway to keep and maintain its property and equipment and to furnish safe, adequate, and proper service as required by act April 21, 1911 (P. L. page 379) sec. 17 (b). (Northampton, Easton & Washington Trac. Co. *vs.* Board of Public Utility Commissioners of New Jersey, 102 Atlantic Rep. 930.)

NEW YORK. — *Apportionment by Commission of Cost of an Improvement Which Required Joint Action of More than One Utility.*

The public service commission law (Consol. Laws, chap. 48) sec. 50, provides that if the commission has determined to order improvements which require joint action by more than one railroad company, it shall notify them that it shall be made at their joint cost, and if, in thirty days, they shall fail to file an agreement for division or apportionment thereof, it shall have authority, on hearing, to fix the proportion of the cost or expense to be borne by each. Held, that the commission need not impose a part of the cost on each, but, if fairness requires it, may order all the cost to be paid by one. (People ex rel. International Railway of City of Buffalo *vs.* Public Service Commission, Second District, (Erie Railroad et al., interveners), 168 New York Sup., 322.)

NEW YORK.—*Person Waiting to Board Car Injured by Car Coming from Opposite Direction.*

Where a car on a single track approached plaintiff, standing under a bright light in the roadway in the usual place to board a car bound the other way, and, when the motorman saw plaintiff turn and diagonally approach the track, he sounded his gong, put on the air brake and reversed the current, but plaintiff's umbrella caught against the side of the car, turning her around and causing her to fall, the street railway was not liable, plaintiff having been to blame for letting her umbrella catch against the car by holding it low to cover her hat and having been preoccupied in looking the other way. (Campbell *vs.* Richmond Light & Railroad, 168 New York Sup., 814.)

TEXAS.—*Misconduct of Jury in Arriving at Verdict.*

In an action for personal injuries, it was flagrant misconduct for the jury in assessing damages to consider the fact that the plaintiff's attorneys would receive 50 per cent of the recovery, and to double their verdict on that account, and to consider items for hospital, medicine and physicians not submitted to it. (San Antonio Traction Co. *vs.* Mendez, 199 Southwestern Rep., 691.)

New Publications

Statistics of Railways for 1906-1916

Bureau of Railway Economics, Washington, D. C. Consecutive No. 120. Miscellaneous Series No. 30. Fifty-eight pages. Paper.

This annual bulletin brings together in convenient form the official statistics of railway operation, based upon official data of the Interstate Commerce Commission, from 1906 to 1916, the latest year for which such data are available. The statistics of net operating income have been compiled to correspond as nearly as possible with the definition of the "standard return" guaranteed by the federal government to the railroads under national control.

Effect of Workmen's Compensation Laws Is Diminishing the Necessity of Industrial Employment of Women and Children

By Mary K. Conyngton. United States Department of Labor, Bureau of Labor Statistics. Bulletin No. 217. Workmen's Insurance and Compensation Series No. 11. Superintendent of Documents, Government Printing Office, Washington, D. C. Paper, 15 cents.

The investigations described in this book were undertaken to throw some light on the question of how workmen's compensation laws compare with employers' liability laws from the point of view of women and children in the families of injured employees. A study was made of the results under the elective compensation system of Connecticut, the compulsory insurance system of Ohio and the employers' liability law of Pennsylvania, which up to Jan. 1, 1916, had no compensation law.

In the author's opinion, the situation may be summed up by saying that in the compensation states the families of victims of industrial fatalities knew with reasonable certainty what they might expect, received it with reasonable promptness and found it, in general, sufficient to keep them from extreme hardship. In the liability state visited, however, the families of decedents were entirely uncertain as to what they would have or when they would get it, and a large proportion were quite certain that they would not receive anything. The author considers the former system preferable.

Personal Mention

Percy Allen Rose has resigned as solicitor of the Johnstown (Pa.) Traction Company.

J. F. Canfield has been appointed auditor of the Ottumwa Railway & Light Company, Ottumwa, Iowa, succeeding C. Brazel.

J. O. Marcum, claim agent of the Ohio Valley Electric Railway, Huntington, W. Va., has been made superintendent of transportation of the company to succeed W. C. Baker.

John W. Williamson, general freight agent of the Ohio Valley Electric Railway, Huntington, W. Va., has been made assistant superintendent of transportation of the company.

W. R. Power has been made general manager of the Ohio Valley Electric Railway, Huntington, W. Va., to succeed H. S. Newton, now manager of railways of the Monongahela Valley Traction Company.

T. D. Rauch has been placed in charge of the new complaint department which has been instituted recently by the Little Rock Railway & Electric Company, Little Rock, Ark., for the purpose of centralizing the settling of complaints.

M. Miers has resigned as master mechanic for the Joplin & Pittsburg Railway at Pittsburg, Kan., and accepted a similar position with the Michigan United Railway at Kalamazoo, Mich. Mr. Miers was with the Michigan United Railway previous to his appointment at Pittsburg.

F. T. Morrissey has resigned as manager of the Eldorado Illinois group of properties of the Southern Illinois Utility Company to become electrical engineer for the Indiana Railways & Light Company, Kokomo, Ind., filling the place made vacant by the resignation of George H. Losey.

Fay Griffith, who has been superintendent of the lighting department of the Little Rock Railway & Electric Company, Little Rock, Ark., has been promoted to the position of superintendent of light and power and has taken over both the meter and line departments of the company.

Walter J. Cummings has been made chairman of the board of directors of the Chicago & West Towns Railway, Chicago, Ill., succeeding his brother, John J. Cummings, who died on May 4. Walter J. Cummings has been closely associated with this railway since its reorganization in 1913. He also has been connected in an official capacity with many other railway projects which he and his brother helped to finance and develop. All his active business life, both as a railway operator and a manufacturer of cars and car equipment, has been spent in studying the needs of the electric railway field.

Charles A. Coffin, chairman of the board of directors of the General Electric Company, has had the rank of Officer of the Legion of Honor conferred upon him by the French government. This was done through Justin Godart, formerly Assistant Secretary of War of France, who is in this country on a special mission. The honor given to Mr. Coffin is in recognition of his services as a member of the executive committee of the War Relief Clearing House for France and as a member of a committee of prominent Americans promoting the establishment of scholarships in French universities for American students after the war.

M. E. Graston, heretofore division passenger and freight agent of the Union Traction Company of Indiana at Indianapolis, has recently been appointed general agent at Indianapolis with authority in all departments at the Indianapolis terminal, subject, of course, to the general department heads. Mr. Graston commenced railroad work in 1890 as telegraph operator and agent at Letts Corner, for the Big Four Railroad. He continued in the service of that company until November, 1914, filling the position of agent at North Vernon, Rushville and Wabash, successively. In January, 1915, he entered the employ of the Union Traction Company in the traffic department, where he remained until June, 1910, when he left the company to become general manager of the electric railway between Indianapolis and New Castle, known as the "Honey Bee Line." This position he occupied until November, 1912, when the "Honey Bee" was taken over by Union Traction Company. Mr. Graston was then made division passenger and freight agent with headquarters at Indianapolis.

Obituary

Edward T. Burrowes, the president of the Curtain Supply Company, Chicago, Ill., died very suddenly recently at his home in Portland, Me. Mr. Burrowes had been president of the company since its organization on May 19, 1899, at which time the E. T. Burrowes Company, the Adams & Westlake Company and Forsyth Brothers Company, sold out their curtain departments to the new concern which was called the Curtain Supply Company. Mr. Burrowes was therefore connected with the car curtain industry from its very beginning, being president of the first company that ever put on the market an automatic car window curtain. Mr. Burrowes leaves a widow and two children.

Construction News

Construction News. Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

Franchises

Portland, Me.—The Portland Railroad, which is operated under lease by the Cumberland County Power & Light Company, has asked the Public Utilities Commission of Maine for its approval of the construction of certain branch-off tracks from its track on Sawyer Street, South Portland, to enable it to reach more easily the Portland shipbuilding plant and other industrial plants in that vicinity. The petition also contained requests for new track locations on Portland and Front Streets and on Sawyer and Front Streets.

Wilmington, N. C.—The Tidewater Power Company has asked the City Council for a franchise to construct an extension of its lines on South Front Street to the city limits and to build a connecting track on Third Street.

East Cleveland, Ohio.—A referendum election will be held in East Cleveland on June 18 on a new franchise ordinance for the Cleveland Railway recently enacted by the City Commissioners. The ordinance fixes the fare at 5 cents with a 1-cent charge for transfer. The franchise is to continue for twenty-five years, but six months before the expiration of each five-year period the question of changing the fare may be submitted to arbitration.

Greensburg, Pa.—The West Penn Railways has received a franchise from the Borough Council of Greensburg for the construction of a switch at Main and Otterman Streets, east, and the extension of its line from Potomac Street to the borough limits.

Newport News, Va.—Application has been made to the City Council by J. N. Shannahan, of the Newport News & Hampton Railway, Gas & Electric Company, representing the Emergency Fleet Corporation, for permission to construct a railway on Fiftieth and Fifty-ninth Streets and Virginia Avenue to transport workmen at the shipbuilding town now being established north of the city limits.

Track and Roadway

***Anniston, Ala.**—It is reported that business men of Anniston have appointed a committee composed of W. H. Weatherly, W. H. McKleroy, Joseph Saks, Ross Blackman and L. L. Crump to organize a company to build an electric or gas-electric railway from Anniston to Camp McClellan, a distance of 6 miles. The company is in the market for relaying rails and also for second-hand or rebuilt cars if the line is to be electrified. Practically all of the fund of $100,000 has been subscribed.

Georgia Railway & Power Company, Atlanta, Ga.—The last issue of *Here We Are*, the publication of the Georgia Railway & Power Company, states that the roadway department has a number of good-sized jobs on hand, despite the fact that but little new construction is being undertaken this year. Both tracks are being rebuilt on Edgewood Avenue from Piedmont Avenue to Bell Street and from Fort Street to near Jackson Street, new rails and paving being laid. The tracks are being relaid on Stewart Avenue to meet a change in grade. Part of the outbound Whitehall Street track is to be rebuilt. If the city decides to repave Peachtree from Five Points to Pine Street all that track must be rebuilt.

Winnipeg (Man.) Electric Railway.—Orders have been placed by the Winnipeg Electric Railway for a number of automatic electric track switching devices for installation at the most congested points on the company's line. If the devices prove satisfactory in operation, they will be adopted as a permanent improvement.

Portsmouth, Dover & York Street Railway, Portsmouth, N. H.—It is reported that the Portsmouth, Dover & York Street Railway will construct an extension from the junction of Dennett Street and Maplewood Avenue, through Cutt Street to Freeman's Point.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has announced that it has fixed June 15 as the date for the opening of the new Lexington and Seventh Avenue lines of the dual subway system. Work is being rushed with all possible speed on the two lines, and there is every indication that all will be ready on the date named except minor details to stations.

Cincinnati (Ohio) Traction Company.—Walter A. Draper, vice-president of the Cincinnati Traction Company, recently wrote a letter to Street Railroad Director W. C. Culkins, in which he objected to extending the East End line to Mount Washington and California, as provided for in a resolution adopted by the City Council, on the ground that the territory is sparsely settled and the line would lose money for the company. He also said that an extension there would depreciate the service some place else, because of the transfer of equipment.

Ohio Electric Railway, Springfield, Ohio.—About 300 ft. of the piling bridge of the Ohio Electric Railway near Hamilton was washed away by high water in the Miami River on May 13. This may prove a serious inconvenience to transportation for some time.

Seattle (Wash.) Municipal Street Railway.—The Board of Public Works has awarded the contract for furnishing materials, labor, etc., for the construction of the elevated line of the Seattle Municipal Street Railway along East Marginal Way and West Spokane Street to C. Geske & Company, Seattle, for $16,186. The contract for the trestle portion of the line, from First Avenue South and Washington Street to Railroad Avenue, south on Railroad Avenue South and Whatcom Avenue to Walker Street, 1½ miles, was let to D. W. Rutherford, Tacoma, for $42,262. The contract for furnishing 800,000 ft. of lumber, consisting of ties, stringers and guard rails for the elevated railway was awarded to the Pacific Northwest Lumber Company at $16,067.

Shops and Buildings

Bangor Railway & Electric Company, Bangor, Me.—A freight house will be erected by the Bangor Railway & Electric Company in Old Town.

Cleveland & Erie Railway, Girard, Pa.—It is reported that the Cleveland & Erie Railway contemplates the construction of a large freight terminal in Conneaut.

Power Houses and Substations

Georgia Railway & Power Company, Atlanta, Ga.—A new 66,000-volt substation has been completed at Calhoun by the Georgia Railway & Power Company. The company has also installed a 2000-kva. synchronous condenser at the Lindale substation.

Interborough Rapid Transit Company, New York, N. Y.—A new transformer station is being built by the Interborough Rapid Transit Company at 150 East Fifty-seventh Street, to cost about $45,000.

Bamberger Electric Railroad, Salt Lake City, Utah.—A fire at the station of the Bamberger Electric Railroad at Thirty-first Street and Lincoln Avenue, Ogden, occurred on May 7 and completely destroyed the plant and equipment of the company, as well as the equipment of the Utah Power & Light Company, and the carhouse adjoining, containing twenty electric cars and several locomotives. The loss is estimated at about $500,000. Plans are being made for the construction of a new fireproof carhouse either at Salt Lake City or Ogden. The reconstruction of the carhouse and sheds and the installation of the equipment for repairing, painting and general upkeep of the rolling stock of the company will cost approximately $100,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Westinghouse Electric Sales $95,735,407

$147,000,000 of Unfilled Orders on April 1, of Which $110,100,000 Is For Regular Products

Evidence of the large demand upon electrical manufacturing companies is shown by the statement in the annual report of the Westinghouse Electric & Manufacturing Company that, as of April 1, 1918, the value of unfilled orders on hand was $147,857,580. Of this amount $110,185,007 was for regular products of the company. On March 31, 1917, the value of unfilled orders for regular products of the company was $39,776,739. Sales billed in the fiscal year ended March 31, 1918, by the company and its proprietary companies, except the New England Westinghouse Company, aggregated $95,735,407. This total compares with $89,539,442 in the preceding fiscal year. The amount of sales billed, as stated for the year just ended, includes shipments since June 15, 1917, from the machine works (formerly Westinghouse Machine Company), also $4,536,000 for munitions.

The volume of sales billed for the regular products of the company, it was stated, was greatly in excess of any previous year. Furthermore, the report said that no facilities heretofore employed on regular products are engaged on munition work.

The income account for the last year follows:

Gross earnings—Sales billed		$95,735,407
Cost of sales—Factory cost, including all expenditures for patterns, dies, new small tools and other betterments and extensions; also depreciations of property and plant, inventory adjustments and all selling, administration, general and development expenses and all taxes		80,225,937
Net manufacturing profit		$15,509,470
Other income—interest and discount	$308,835	
Dividends and interest on sundry stocks and bonds owned	903,559	
Miscellaneous—royalties, etc.	112,869	1,325,263
Gross income from all sources		$16,834,733
Deduction from income—interest on bonds and debentures	$303,917	
Interest on notes payable	1,108,046	
Miscellaneous interest	17,089	1,429,052
Net income available for dividends and other purposes		$15,405,681

The surplus as of March 31, 1917, $18,105,298, was increased by the net income of $15,405,681 for the year, making the gross surplus $33,510,979.

In addition to the regular quarterly dividends at the rate of 7 per cent per annum on the preferred and common stocks, a special "Red Cross" dividend was paid, making a total of $5,610,848 for all dividends paid during the year.

Special appropriations were made for the protection of inventory book values and to establish a research and development fund. After deducting these appropriations and other miscellaneous adjustments the net surplus as of March 31, 1918, is $26,404,694, an increase of $8,299,396 over the net surplus as of March 31, 1917.

Railway Lamp Stocks Growing Stronger

Manufacturers Advise Managers and Purchasing Agents to Place Orders—Shortage May Occur Again

Just how much the observance of the so-called daylight saving law is affecting the sale of incandescent lamps has not been determined. Experts are making estimates and, roughly speaking, it is believed that from 5,000,000 to 10,000,000 fewer lamps a year will be sold. With an annual production of about 210,000,000 lamps, these figures, in comparison, may not look formidable; but, nevertheless, they constitute quite an item. The demand for lamps has fallen off, as it always does, with the lengthening days and approach of summer. Manufacturers now say they are accumulating a good stock at all their plants in nearly every size and type of electric car lamps.

One of the largest manufacturers reports its stock in excellent condition for early shipments. Headlight and projecting lamps are also in a like favorable position. This is also true, possibly in slightly lessened measure, of other producers.

What the manufacturers, some of whom are launching an educational campaign on the subject, desire railway managers and purchasing agents to understand is that within the next few weeks—no later than June, they say—buyers should give serious attention to placing orders for their fall and winter requirements. This is because war conditions are radically different in every aspect from normal times. The transportation situation will be more congested, and another shortage similar to that of last fall may occur. Productive capacity has not been curtailed.

Car Curtain Supply Elects New Officers

To Move Into More Spacious Quarters Owing to Rapid Growth in Business

At a meeting of the directors of the Curtain Supply Company, held on April 30 last, Holmes Forsyth, formerly second vice-president and secretary, was elected president, succeeding the late Edward T. Burrows. Mr. Forsyth has been in active charge of the company since its organization in 1899, having at that time been elected secretary and general manager, which office he has held until his recent election as president.

Ward W. Willets, vice-president and treasurer and one of the organizers of the Curtain Supply Company, was re-elected.

Randolph S. Reynolds was elected secretary. He has been with the company since 1912. Prior to that time he was with the Western Steel Car & Foundry Company at Anniston, Ala., and the Pressed Steel Car Company at Pittsburgh, Pa., having been connected with the purchasing departments of these companies from 1905 to 1912. He left the latter in 1912 to accept a position with the Curtain Supply Company and later was made assistant to the general manager.

The Curtain Supply Company, owing to the necessity of having more space due to the growth of its business, has leased almost the entire building at 350-356 West Ontario Street, Chicago, and will be located there after the first of June. The new quarters will be about 50 per cent larger than the old, and in addition to having the advantage of greater and more efficient manufacturing facilities, the company will have its own switch track for shipping and receiving. The company has been at the old location at 320 West Ohio Street, Chicago, for about nineteen years, during which time not only has the business in its regular line of car curtains and fixtures grown in volume but also it has added other departments to handle new articles which it has developed and is manufacturing.

Government Prices of Coal

The United States Fuel Administration has just issued an official list of prices for coal in effect on April 22, 1918. The quotations are for coal f.o.b. at the mines, by districts and for different sizes, with the monthly summer reduction, allowance for rescreening, etc. The circular is known as publication No. 4D, 1918.

Large Order for Checking Device

Bay State Street Railway Buys Fifteen Hundred Economy Meters for Car Service

Following an extended investigation, the Bay State Street Railway, Boston, Mass., has purchased about 1500 Sangamo Economy watt-hour meters for use in its entire active passenger equipment. The order represents an expenditure of about $75,000. It is understood to be for the largest number of checking devices ever ordered by an electric railway outside New York City. It is being filled by the Economy Electric Devices Company, Chicago, exclusive sales agent of these meters, the contract calling for the delivery of about 500 meters per month.

It is planned first to install the meters on rolling stock operating on the Gloucester division, then to extend their application to all the lines of the company north of Boston; and finally, to provide meters for all passenger cars south of Boston. More than 900 miles of line will ultimately be served in this way, and in due course it is expected that meters will be provided for the company's express and freight cars. Within the next week or two the cars on the Gloucester division will be fully equipped.

Five sizes of meters are being purchased, ranging in capacity from 50 to 200 amp. In addition to the passenger cars of the semi-convertible type to be equipped with meters, some of the remaining open cars operated by the road will be thus furnished, interchanging meters with closed cars used in the winter season.

The decision of the company to install these meters is a result of a vigorous campaign on the part of the management, in which the car-service employees are co-operating, to realize the benefits of more economical operation. Before the meters were ordered, representatives of the employees were asked to join the officials of the road in an investigation of the opportunities for saving energy in car operation with the aid of checking devices in the motor circuit.

Through a recent agreement by which the employees are to share in the economies gained in operation, realizing bonuses according to certain expense reductions, the interest of the employees in power saving has been heightened. The use of these meters will enable the company to study with nominal additional expense the economy of various types of car equipment on particular routes and in certain districts, the fitness of motors for stated services, suitability of gear ratios, effect of changes in schedule speed, etc., on power consumption, as well as continuously to check the condition of the mechanical and electrical equipment of the cars.

Record blanks are being developed for the use of motormen in taking and leaving cars equipped with meters, and a number of trial meters tested on Revere and Lynn lines will remain in these services.

The meters will be equipped with cyclometer dials which register from 0 to 10,000 kw.-hr.

Favorable Legislation Will Help Market

More Optimistic Viewpoint Justified—Effect of Rising Prices and Trying Delivery Conditions

Manufacturers of electric railway supplies who have been disappointed with the volume of orders from the transportation field, affected as it inevitably has been by inadequate fares and extraordinary operating costs, need not despair of better times if prospective legislation is realized looking toward increased net earnings of these important utilities. In Massachusetts, for example, the outlook is unusually good for the passage at the present session of laws establishing the principle of service-at-cost on the Boston Elevated Railway, the Bay State Street Railway, and the other properties within the State.

The general situation is now perfectly clear, even to the layman; some means of providing fresh capital to enable these utilities to do their vitally essential part in the public service of a great war period must be had, and the absence of any extended opposition to the service-at-cost principle indicates that if this legislation passes the hand-to-mouth policy in equipment and supply purchasing practiced for many months, one almost said years, past will give way to consistent and long-sighted buying.

The average electric railway purchasing agent has been anything but joyful of late, and with sufficient reason. Rising prices and the most trying delivery conditions known to the industry have combined to depress him; but now that the public has become educated to the war price standard and appears ready to pay the fair cost of service rendered it, including wages to capital as well as to labor, a more optimistic viewpoint is justified. Of course, many plants formerly exclusively devoted to the manufacture of transportation supplies are now working night and day on war orders, and doubtless some of these factories could not take on additional work for the traction properties without a capital outlay difficult to secure, at present.

The vital importance of electric railway transportation as a war tool on this side of the Atlantic, however, is recognized by army and navy officials, especially where the housing problem hampers the rapid development of shipbuilding and munitions plants. As a buyer of material the electric railway in many cases is entitled to priority consideration, and if the question of revenue is settled for the time being by wise legislation it will be safe to anticipate a decided expansion of business in the supply field.

St. Louis Car Company's Strike Settled

War Labor Board Effects Agreement Allowing Increased Wages and Collective Treatment

The National War Labor Board authorizes the following:

Settlement of the strike of the employees of the St. Louis (Mo.) Car Company has been effected by the sub-committee of the National War Labor Board composed of C. E. Michael and Victor Olander, representing capital and labor, respectively. Following an all-day conference with representatives of both sides, the sub-committee submitted a form of agreement providing that the men should return to work immediately; that the company grant a temporary 10 per cent uniform increase in wages; that the company agree to meet with the chosen representatives of the employees to adjust all points of dispute; and that both sides agree to submit any points of disagreement to the National War Labor Board or its authorized committee, whose decision both sides agree to accept. This agreement was joined in by both sides.

May Keep Copper at 23½

Recommendation that the maximum price of copper fixed by the government at 23½ cents a pound at Eastern refineries be continued for seventy-five days, beginning June 1, was made to President Wilson to-day by the Price-Fixing Committee of the War Industries Board. Final decision rests with the President, who is expected to issue a proclamation in a few days.

Rolling Stock

New York State Railways (Syracuse Lines), Syracuse, N. Y., in its order for twenty-five cars, of which the specifications appeared in last week's ELECTRIC RAILWAY JOURNAL, specified the date of ordering as March, 1917, with delivery March, 1918.

L. L. Crump, Anniston, Ala., who with others, it is reported, has raised $100,000 to organize a company to build a railway to Camp McClellan, are in the market for second-hand or rebuilt cars, if the line is electrified, and for relaying rails. Mr. Crump and associates are also interested in gasoline motor cars, and request information on these.

Southern Public Utilities Company, Charlotte, N. C., is reported as having ordered four steel passenger cars from the Southern Car Company, High Point.

Bamberger Electric Railroad Company, Salt Lake City, Utah, on May 7, at Ogden, Utah, had its carhouse, twenty cars and several electric locomotives destroyed by fire. No salvage is reported on the property. It is said that the company had but six cars remaining and the system was nearly crippled. Efforts will be made to replace the rolling stock at once.

Trade Notes

H. W. Johns-Mansville Company, New York, N. Y., will have its office at Houston, Tex., at 424-426 Washington Avenue after July 1.

Railway Power & Equipment Company, New York, N. Y., has been organized with a capital of $100,000. The directors are A. G. Logan and Ernest Stuart, Brooklyn, N. Y.

Elastic Car Waste Company, Philadelphia, Pa., has removed from Hope and Palmer Streets to Ninth and Columbia Streets, where it will have improved and enlarged facilities.

Eastern Tube & Tool Company, Brooklyn, N. Y., is now the name of what was formerly the Eastern Flexible Conduit Company. The company has added to its former line the manufacture of drill chucks and small tools. The factory is at 41 Gardiner Avenue, and the general office address is 594 Johnson Avenue.

Chester H. Pennoyer on April 7 became general sales manager of the National Conduit & Cable Company, New York, N. Y. He will devote much of his time to traveling in the Eastern States. Mr. Pennoyer is from Oakland, Cal., where he was physical superintendent of the Great Western Power Company during the construction of the big hydroelectric plant.

McGuire Cummings Manufacturing Company, Chicago, Ill., announces that Walter J. Cummings has succeeded his brother, John J. Cummings, deceased, as president of the company. M. C. Bovil, formerly assistant superintendent of the company's plant at Paris, Ill., has been made superintendent of the Paris plant. No change of policy is contemplated in connection with the car and truck building activities of the company.

M. C. Turpin, formerly assistant to manager, Westinghouse department of publicity, has resigned to enter federal service as assistant to manager, technical publicity bureau, ordinance department. Mr. Turpin's work will be on the dissemination of information from the War Department to manufacturers, through the medium of the trade press. Mr. Turpin is a graduate of Alabama Polytechnic Institute and of Cornell University. After several years' experience in the construction and operation of central station plants, he entered the Westinghouse department of publicity in 1909. He is an associate member of the A.I.E.E., N.E.L.A., Pittsburgh Press Club, Pittsburgh Ad Club, and of the Illuminating Engineering Society

New Advertising Literature

Coppus Engineering & Equipment Company, Worcester, Mass.: Bulletin describing its turbo-blowers for undergrate work.

Walter A. Zelnicker Supply Company, St. Louis, Mo.: Bulletin No. 243 listing and describing apparatus, machines and railway specialties being offered by the company.

General Electric Company Schenectady, N. Y.: Bulletin 47070, entitled "Lowest Current Standard Unit Panels for General Power Service." It is in loose-leaf form for filing, illustrating and describing the system and equipment.

Earle Gear & Machine Company, Philadelphia, Pa.: Illustrated booklet, just off the press, entitled "Economy in Cold Sawing," descriptive of the company's "Lea Simplex" saws, both belt and motor driven, and adaptable to a wide variety of work.

Imperial Brass Manufacturing Company, Chicago, Ill: Imperial catalog No. 142, which describes in detail the full line of Imperial welding and cutting equipment and Imperial burning and lead burning outfits. Various industries which use welding and cutting equipment are listed. Five points of superiority claimed for the Imperial equipment are analyzed: Safety, practicability, durability, economy and portability. The Imperial mixing principle is also thoroughly explained. Several different sizes of Imperial outfits are illustrated and described fully, and all parts are cataloged.

Johnson Fare Box Company, Chicago and New York: Descriptive catalog of the Johnson registering fare box in its different forms for car and station platform operation. Views are shown of different types of metal tickets and change carriers sold by the company. The catalog also describes certain features of operation such as the effect of fare boxes on car schedules, their relation to conductors, maintenance, action with faulty coins or counterfeits, etc.

NEW YORK METAL MARKET PRICES

	May 15	May 22
Copper, ingots, cents per lb.	23¼	23¼
Copper wire base, cents per lb.	26½ to 26¾	26½ to 26¾
Lead, cents per lb.	6.90	7.05
Nickel, cents per lb.	50	50
Spelter, cents per lb.	7 37½	7.50
Tin, Chinese,* cents per lb.	$1.05	$1.03
Aluminum, 98 to 99 per cent., cents per lb.	†32.10	†32.10

* No Straits offering. † Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	May 15	May 22
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19½	19½
Red brass, cents per lb	18	18½
Yellow brass, cents per lb.	13	13
Lead, heavy, cents per lb.	6	6
Zinc, cents per lb.	5¼	5¼
Steel car axles, Chicago, per net ton.	$41.52	$41.52
Old carwheels, Chicago, per gross ton.	$29.00	$29 00
Steel rails (scrap), Chicago, per gross ton.	*$34.00	*$34 00
Steel rails (relaying), Chicago, gross ton.	$60.00	$60.00
Machine shop turnings, Chicago, net ton.	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	May 15	May 22
Rubber-covered wire base, New York, cents per lb	27 to 34	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	30.40 to 34½	30.40 to 36.10
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.00
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 500-ton lots, per gross ton	$65.00	$65.00
T-rails, high (Shanghai), cents per lb.	4½	4½
Rails, girder (grooved), cents per lb.	4½	4½
Wire nails, Pittsburgh, cents per lb.	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb.	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb.	8	8
Tie plates (flat type), cents per lb.	*3½	*3½
Tie plates (brace type), cents per lb.	*3½	*3½
Tie rods, Pittsburgh base, cents per lb.	7	7
Fish plates, cents per lb.	*3½	*3½
Angle plates, cents per lb.	*3½	*3½
Angle bars, cents per lb.	*3½	*3½
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb.	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb.	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb.	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount, F. O. B. factory	80%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount, F. O. B. factory	80%	80%
Car window glass (double strength, all sizes AA quality), New York, discount, F. O. B. factory	82 & 3%	82 & 3%
Waste, woo (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13½	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.00
Asphalt filler, per ton	$45.00	$45.00
Cement (truckload lots), New York, per bbl.	$3.20	$3.20
Cement (carload lots), Chicago, per bbl.	$3.26	$3.26
Cement (carload lots), Seattle, per bbl.	$3.60	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.62	$1.58
White lead (100 lb. keg), New York, cents per lb.	10	9
Turpentine (bbl. lots), New York, cents per gal	42½	51½

* Government price.



Peacock Brakes are Standard

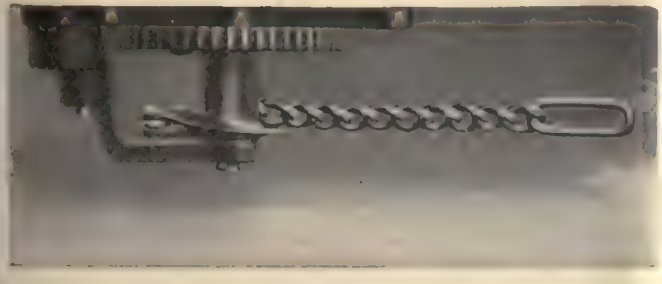
with both Washington Companies

Have you noticed that both the Capital Traction Company, in ordering twenty cars, and the Washington Railway & Electric Company, in ordering fifty cars, specified Peacock Brakes—the newer type with the chain winding up instead of down?

They had the solid reasons of proved safety, satisfactory operation and low maintenance to make this decision. A hand brake must be mighty good to be used as the only brake on several hundred (Washington R. & E.) cars.

Practically all Washington cars carry Peacocks. Both companies believe in keeping them tuned up, too. The Capital Traction Company tests them out every round trip at the uptown end of the line, while the Washington Railway & Electric Company does so at points in the center of the city.

You cannot get a brake easier to maintain than the Peacock.



National Brake Co.
Buffalo, N. Y.

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Industrial Plants and Buildings, Steam Power Stations, Water Power Developments, Substations, Gas Plants, Transmission Lines, Electric and Steam Railroad Work.
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Analytical Studies of financial and operating conditions, appraisals and rate adjustments of electric railway and all public utility properties.
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REPORTS APPRAISALS. OPERATION
50 Church Street, New York

You are a faithful subscriber and reader of the Electric Railway Journal. You know how useful it is to you. Why not give us the names of those of your electric railway friends who would also benefit by being subscribers to the Electric Railway Journal? We will be glad to send specimen copies to any names and addresses that you mention.
ELECTRIC RAILWAY JOURNAL

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Electrical, Photometrical and Mechanical Testing.
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PHILADELPHIA, PA.
POWER STATIONS GAS WORKS
HYDRAULIC DEVELOPMENTS ELECTRIC RAILWAYS

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

4 Repeat Orders for THERMIT WELDS

On the Third Avenue Railway System, New York



Southern Boulevard, Between 149th and Baretto Sts.

Order No. 5—Part Two

The second installation on this repeat order for Thermit Welds was made on rail section 494 on the Union Railways, Southern Boulevard between 149th and Baretto Streets.

The Company's own men made the entire installation. There have been no failures to date.

Thermit Welds Pay Big Dividends

They eliminate the continuous heavy upkeep for the renewal of bonds while retaining practically 100 per cent rail conductivity.

The wear is about even with that of the rail so that dished joints and the resulting destructive pounding will not occur.

The fact that Thermit Welds have established their complete success at New York, Pittsburgh, Los Angeles, Youngstown, San Antonio and other leading American cities should warrant your careful consideration.

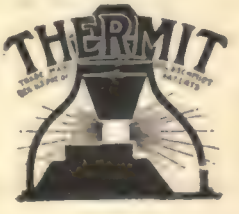


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Successors to Goldschmidt Detinning Co. and the Goldschmidt Thermit Co.

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Factories located at Chrome, N. Y.; Wyandotte, Mich.; East Chicago, Ind.; Jersey City, N. J.



The MECHANICAL RAILWAY TIE



BETTER TRACKS
at Less Cost

Can Be Laid
by using
D.M. Ties all
the way!

Permanent—
Resilient—
Economical.



Are the Result
of careful
construction.

And the best and most careful method known so far is that of using D.M. Ties.

And these Ties have **Made Good** with a vengeance.

Dayton Mechanical Railway Ties are not only a **theoretical** solution of track troubles. They are the **practical** outcome of years of work and tests on track carrying both city and heavy, high-speed, interurban cars.

Write for full particulars.

THE DAYTON MECHANICAL TIE CO.
201 Third Street Arcade
DAYTON, OHIO



Main filling or backbone of rolled rail crossing broken at flangeway intersection

Rolled Rail Crossings

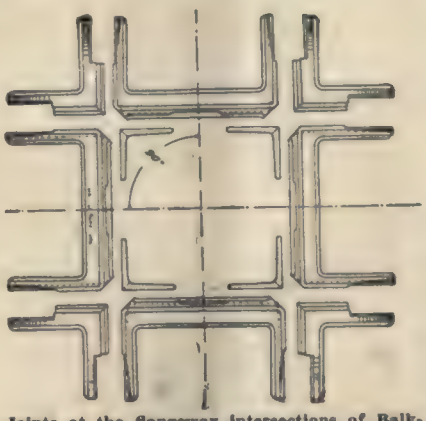
develop frequent fractures at the point shown in the picture to the left. Such breaks are unavoidable because of the lack of flexibility at the flangeway intersections.

Experience has demonstrated that rolled rail wears out in less than one-quarter the time of cast manganese.

As a result these crossings have to be replaced frequently so that their apparent lower first cost, when compared with that of articulated cast manganese crossings, is deceptive.

Balkwill Articulated Cast Manganese Crossings

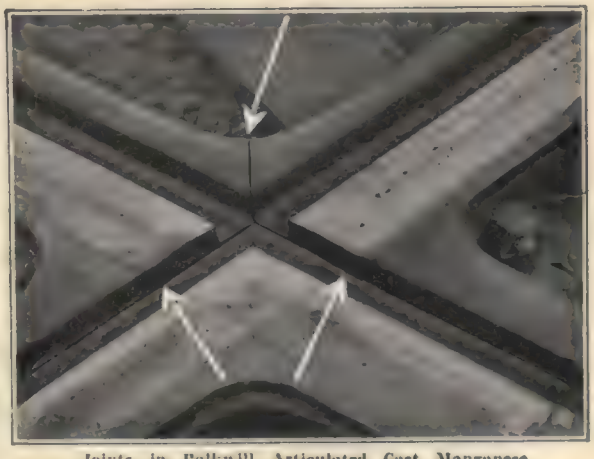
have scientifically designed joints at the places where breakage formerly occurred. It takes several rolled rail crossings to equal the life of but *one* Balkwill Articulated Cast Manganese Crossing. Therefore the Balkwill Crossing is the cheapest in the long run.



Joints at the flangeway intersections of Balkwill Articulated Cast Manganese Crossings positively eliminate breakage

It saves interruption to traffic, makes less demand on labor, which is now so scarce, and also reduces the cost of making replacements frequently.

In other words, it gives you



Joints in Balkwill Articulated Cast Manganese Crossings are life savers. They positively prevent breakage at flangeway intersections, permitting 100% wear before renewal is necessary

MORE WEAR PER DOLLAR THAN ANY OTHER CROSSING YOU CAN BUY

Order Balkwill Articulated Cast Manganese Crossings Direct from Your Special Work Manufacturers

Write us for detail information and list of installations. Don't accept a substitute as there is none.

The Balkwill Manganese Crossing Co.

506 Williamson Building, Cleveland, Ohio



We Have Many Irons in the Fire





BUT each kind of iron (or product) is watched by a specialist. That's at the bottom of Columbia success, for our organization has a Jack for each trade.

The department for turning out trolley poles, for instance, is just as distinct from the gear cases as the hardware is from the silks in a high-class department store.

Therefore, when you order any of the products listed below you are assured that they will be made by specialists.

Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St.

Brooklyn, N. Y.

W. R. Kerschner Co., Inc., N. Y.
Holden & White, Inc., Chicago
F. F. Bodler, San Francisco
Railway & Power Eng. Co., Ltd., Toronto, Ont.



TOOLS

Armature and Axle Straighteners
Armature shaft straighteners
Armature buggies and stands
Babbitting molds
Banding and heading machines
Car hoists
Car replacers
Coil taping machines for armature leads
Coil winding machines
Pinion pullers
Pit jacks
Signal or target switches
Tension stands

CAR EQUIPMENT

Armature and Axle Bearings
Armature and field coils
Bearings (Axle and Armature)
Brush-holders and brush-holder springs
Brake, door and other handles
Brake forgings, riggings, etc.
Car trimmings
Commutators
Controller handles
Forgings of all kinds
Gear cases (steel or mall. iron)
Grid resistors
Third-rail shoe beams and accessories
Trolley poles (steel) and wheels



"We Have 208 of These Fare Boxes in Service and Have No Cause For Complaint"

—Connecticut Co.

This is how the Connecticut Company—one of New England's leading electric railways—expresses its satisfaction of the service given by

JOHNSON FARE BOXES



They insure a practically 100 per cent fare collection for the railway company.

The passengers deposit their own fares into the box.

The conductor becomes a "change maker" in place of a fare collector, thereby decreasing the incentive for dishonesty to almost nothing.

The conductor gets more time to attend to his other duties, insuring greater safety to passengers.

There are now more than 10,000 Johnson Fare Boxes in use on prominent railways.

Let us help you get all the fares you earn. **Full details on request. Write.**

JOHNSON FARE BOX COMPANY

Jackson Boulevard and Robey St., Chicago

50 East 42nd Street, New York



Just Attach Them to the Rail and WELD



A Demonstration Will Quickly Prove Their Superiority



Ease of installation is but one of the many cost-saving features of

LINCOLN WELDED BONDS

They reduce the rail drop to the minimum—saving power and improving schedules.

The Lincoln Bonding Machine is readily portable and can be operated by two men.

Produces a carbon or metallic arc with minimum resistance loss and the least danger of breaking the arc.

The first cost of both the machine and the bonds themselves is less.

Upkeep charges are very small.

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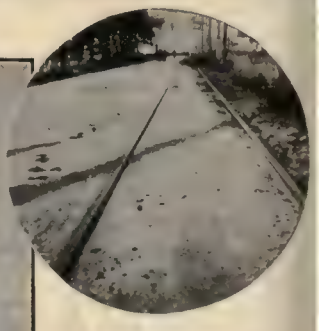
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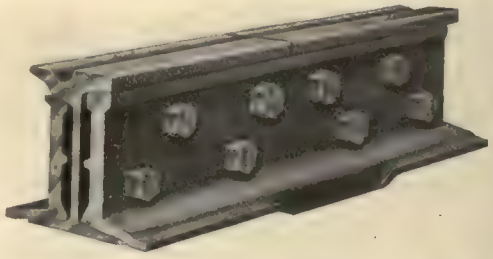
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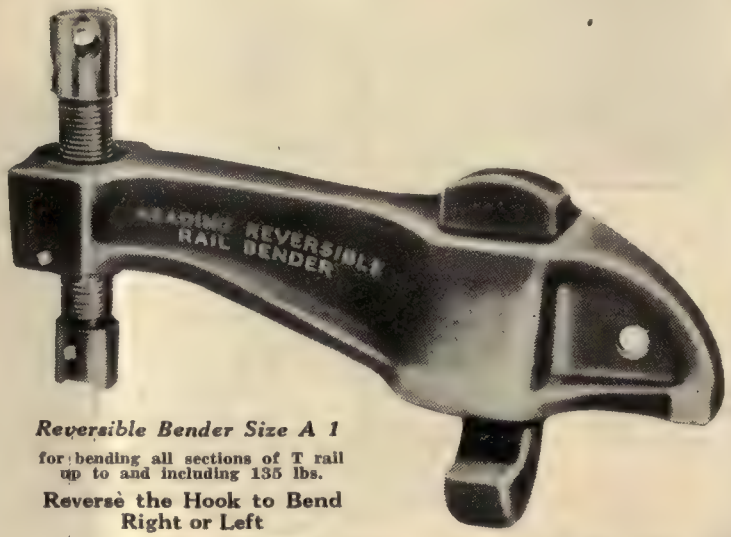
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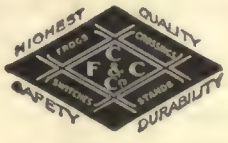
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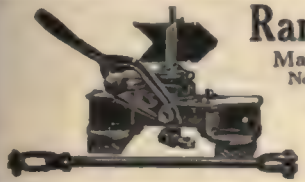


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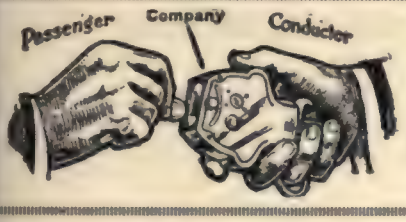
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KARBOLITH CAR FLOORING—for steel cars; is sanitary, light weight, fire proof, non-slippery.
STANWOOD STEPS—Self-cleaning, non-slippery, light.
Our products used on all leading railroads, on cars and stations. For details address:
AMERICAN MASON SAFETY TREAD CO., Lowell, Mass.
Branch Offices: Boston, New York City, Philadelphia.
Agencies in all principal cities.



Samson Bell and Register Cord
Solid braided cotton, extra quality. All sizes and colors. More durable, more economical and better looking than leather or rawhide. Send for samples and full information.
SAMSON CORDAGE WORKS BOSTON, MASS. 2

UNIVERSAL ANTI-SLIP TREADS

cars and station steps.

Universal Safety Tread Company
Waltham, Mass.

"Boyerized" Products Reduce Maintenance

Bemis Trucks	Manganese Brake Heads
Case Hardened Brake Pins	Manganese Transom Plates
Case Hardened Bushings	Manganese Body Bushings
Case Hardened Nuts and Bolts	Bronze Axle Bearings

Bemis Pins are absolutely smooth and true in diameter. We carry 40 different sizes of case hardened pins in stock. Samples furnished. Write for full data.

Bemis Car Truck Co., Springfield, Mass.

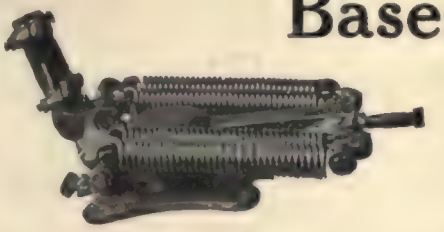
The "Hycap-Exide" Battery

for

STORAGE BATTERY STREET CARS

THE ELECTRIC STORAGE BATTERY CO
PHILADELPHIA

Your Trolley Bases



It is to your advantage to install the best appliances on your cars and particularly at this time when absolute reliability of transportation facilities is demanded.

Nuttall Ball and Roller Bearing trolley bases minimize the effects of track and overhead inequalities.

Drop a card for detailed information.

NUTTALL PITTSBURGH

BRAKE SHOE STANDARDS

BRAKE HEADS—to take
Standard Pattern Shoe
One standard driver shoe
One standard car shoe
And there you are—

ASK US

American Brake Shoe & Foundry Co.
30 Church St., New York
McCormick Bldg., Chicago Chattanooga, Tenn.

The Art of Buying

is as much a reality as is the Art of Selling. Advertising of the right kind helps the *buyer* as much as it does the seller.

The Electric Railway Journal Service Department helps advertisers prepare advertising copy of real interest and use to Journal readers.

The Service Department is ready to serve you, Mr. Manufacturer.



VAN DORN COUPLERS

are made for every condition and requirement. M. C. B. Pin and Link, Car and Air, in all sizes and types.

VAN DORN COUPLER CO.
2325 So. Paulina St., Chicago, Ill.

N-L INDICATING TAILLIGHTS HELP CARS MAKE BETTER TIME

Colored lights are notification to those following of the movement of the car's controller. Helps avoid rear-end accidents; avoids delays of cars behind. Used on leading railways.

THE NICHOLS-LINTERN CO.
Cleveland, Ohio, U. S. A.

GURNEY BALL BEARINGS

HORNE RAILWAY DEVICES

Horne Double Acting Brakes
Giant Geared Brakes
Differential Stafless Brakes
Sterling Safety Brakes
Sterling Trolley Bases
Sterling Sand Boxes
Lord Screenless Air Cleaners for Compressors
Q-P Trolley Catchers
Hydrogrounds and Lightning Arresters
Fenders and Wheelguards
Controller Fingers
Friction and Rubber Tape
Packing and Gaskets
Air Hose and Rubber Specialties

HORNE MANUFACTURING CO., 50 Court St., Brooklyn, N. Y.

One of the essentials
in your selling (or advertising)—

McGRAW ELECTRIC RAILWAY LIST

***February*, 1918**

Published Semi-Annually
in Connection with the
McGraw Electrical Trade Directory
[Railway Edition]

Subscription Price $5.00 per Year
Single Copies $3.00

McGraw-Hill Company, Inc.
10th Avenue at 36th Street
New York

the McGraw Electric Railway List—

for years the only authentic and complete list of Electric Railway Companies in the United States, Canada and Mexico.

To make the most of your business, you must know the *men* of your industry. Your salesmen must keep a firm grip on its personnel.

Do You Know

that 35% of the men in official positions with electric railways change in a single year?

ORDER THE LATEST ISSUE NOW

SEARCHLIGHT SECTION

Water Tube Boilers

1—600-hp. Babcock & Wilcox, 200-lb. pressure.
2—508-hp. Babcock & Wilcox, 200-lb. pressure.
2—483-hp. Heine, 200-lb. pressure.
1—400-hp. Babcock & Wilcox, 160-lb. pressure.
4—360-hp. Erie City, 160-lb. pressure.
14—290-hp. Babcock & Wilcox, 160-lb. pressure.
2—283-hp. Aultman & Taylor, 160-lb. pressure.
2—283-hp. Babcock & Wilcox, 160-lb. pressure.
3—243-hp. Heine, 160-lb. pressure.
1—240-hp. Stirling, 140-lb. pressure.

We shall be glad to mail complete list of electrical, steam and hydraulic machinery upon request.

MacGOVERN & COMPANY, Inc.
114 Liberty St., New York, N. Y.

Complete Power Plant

Delivery Approx. May 1st

2—780 KVA Westg. Turbo Outfits, 3-ph, 60-cy., 2400-V., 3600 R.P.M., complete with switchboards and exciter units; also condensing apparatus. 4-338 H.P. Keeler Water Tube Boilers with breeching, stack, pumps.

TURBINES

1—2500 KVA. Gen. Elec. Curtis Horz. Turbo Outfit, 2-phy., 60-cy., 2300-V., 3600 R.P.M., 150-lb. steam pressure, with Westg. Le Blanc Condenser.
1—500 Kw. Gen. Elec. Curtiss Turbo Outfit, 3-ph., 60-cy., 2300-V., 1800 R.P.M., 150-lb. steam pressure. Vert. type.
1—500 Kw. Westg. Horz., 3-ph., 60-cy., 360-V., 3600 R.P.M. Turbo Outfit.
1—100 Kw., Gen. Elec. Turbo Outfit, 3-ph., 60-cy., 2300-V., 3600 R.P.M., 125-lb. steam pressure.

ARCHER & BALDWIN, Inc.
114-118 Liberty St., New York, N.Y. Telephone 4337-4338 Rector

WANTED

ONE CAR WHEEL BORING MACHINE

Boring wheels 36 in. in diameter maximum.
Either belted or motor driven.

The Hagerstown & Frederick Ry. Co.
Frederick, Md.

FOR SALE

GENERATOR AND ENGINE

One Westinghouse 250 KW., direct current Generator, E.M.F. 575, amps. 435, speed 450, Serial No. 162052, belt driven.

Hamilton Corliss engine, 20 in. x 42 in., wheel 15 ft. diameter, 36 in. face, all in first-class condition, immediate delivery.

HENRY A. HITNER'S SONS CO.
Station K, Philadelphia, Pa.

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.
We positively own these Rails and offer same in carload lots and over.
25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.
Immediate shipment guaranteed and prices very attractive.
Carload and less than carload inquiries and orders solicited.
Rails cut to length for structural purposes.
Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Building, Pittsburgh, Pa.

FOR SALE

1—550 V.

RAILWAY GENERATING UNIT

consisting of McIntosh & Seymore Compound Condensing engine, 13 in. x 26 in. x 30 in., 150 rpm., 120 lbs. boiler pressure and 364 amp. General Electric MP. Generator. All in first-class operating condition.

AUSTIN STREET RAILWAY CO.,
Austin, Texas.

Direct Current Belted Generator

1—500-kw., 550-V., 320 r.p.m. Cp. Wd. Westinghouse 3 bearing direct current generator.

DUQUESNE Electric & Mfg Co.

Write, wire or 'phone our nearest office, Pittsburgh, Pa., or 230 La Salle St., Chicago, Ill.

RAILS

RELAYERS—NEW

If you have any to sell, 12 lb. to 100 lb., write, wire or phone us.

GENERAL EQUIPMENT CO
30 Church Street, New York City

CLEVELAND ARMATURE WORKS
Cleveland, Ohio

Everything in the Line of Repairs to Electrical Machinery

Complete Armatures, New Armatures, Rewound Armature Cores, Armature Shafts, Armature Coils, Fields and Commutators.

Established 22 Years.

SEARCHLIGHT SECTION

FOR SALE

One 80 hp. Horizontal Mietz & Weiss

OIL ENGINE

complete with stack; engine in first-class condition.

LINCOLN MILLS, INC.
Lincoln, Neb.

GONDOLA CARS

8—Gondola Cars, standard gage, 18 x 8 ft. inside, double trucks, 24-in. wheels, air and hand brakes, six have drop sides. Weigh approximately 17,000 lb.

JAMES STEWART & CO., Inc.
Contractors
30 Church St., New York City.

FOR SALE

Turbine Generator

Vertical type Curtis steam turbine generator, 500 K.W. capacity, 1800 R.P.M., full load, voltage 4000, complete with switchboard, condensing apparatus and piping.

THE COLUMBUS RY., PR. & LT. COMPANY
14 N. High Street, Columbus, Ohio

ANSWERS

addressed to us at 36th St. and 10th Ave., New York; Old Colony Bldg., Chicago; Real Estate Trust Bldg., Philadelphia; or Rialto Bldg., San Francisco, will be forwarded without charge (excepting circulars or similar literature).

FOR SALE

Variable Speed Motor

May Be Used as Generator

Sprague Electric, general type C, No. 82,823. Amp. 106, Volts 220, 23.3 Kw. or 31.2 Hp., R.P.M. 350/1470.

THE PARALITE COMPANY
609 Swetland Bldg., Cleveland, O.

Power Equipment

BOILERS

2—400 h.p. Wickes.
3—300 hp. Wickes, with Murphy Stokers. Fine condition; 150 lb. pressure.

GENERATOR

300 k.v.a. Westinghouse, 440-volt, 60-cycle.

STACK

78-in. x 100-ft., self-supporting.
54-in. x 100-ft., stack.

PUMPS

2—10 x 6 x 10-in. Worthington, outside packed.

HEATERS

2000 h.p. Goubert.
1200 h.p. Goubert.
1000 h.p. Cochrane.
Send for our complete list.

Wickes Machinery Company,
Jersey City, N. J.

Rails

100 tons 7 in., 70 lb., Shanghai Relayers.
125 tons 9 in., 90 lb. Girder Rails.
500 tons 60 lb. A.S.C.E. with angles. New.
150 tons 65 lb. A.S.C.E. with angles. New.
400 tons 100 lb., with angles. New
Full Stock, All Weights.

Interurban Cars

1—Combination, 38 ft. over platforms, 28 ft. inside. Passenger compartment 20 ft., baggage compartment 8 ft., seating capacity 36. Four G. E.-1000 motors. Double end control.
1—Passenger, 38 ft. over platforms, seating capacity 42. Two G. E.-1200 motors. Double end control.
Both in First-Class Condition.

ZELNICKER IN ST. LOUIS
GET BULLETIN 237—70 BARGAIN PAGES.

Owing to the holiday next week, all our forms will go to press one day earlier than usual.

Searchlight can be accepted until

4 P.M. on Tuesday

Electric Railway Journal
10th Ave. at 36th St., New York

Keep your eye on the Searchlight and your advertisements in it.

FOR SALE

1—425 kw. G. E. Continuous Current

GENERATOR

type M. P., 80 r.p.m., 500/550 volts, 773 amperes, full load, direct connected to Hamilton-Corliss

ENGINE

cylinder 28 in. x 48 in., S. P. 100 lb; floor space 29 ft. x 7 ft. 6 in. Delivery June 15.

Price on application.

ELECTRICAL CONSTRUCTION CO.
2035 Washington Ave., Philadelphia, Pa.

RAILS

RELAYERS—NEW

Write, wire or phone us if you need any. 8 lb. to 100 lb. section.

GENERAL EQUIPMENT CO.
30 Church Street, New York City

CAR BARGAINS

OPEN and CLOSED MOTOR and TRAIL

Write for Price and Full Particulars to

ELECTRIC EQUIPMENT Co.
601 Commonwealth Bldg. Phila. Pa.

SEARCHLIGHT SECTION

THE SEARCHLIGHT SECTION

will locate the Man you want
Position you want
Equipment you want

Are you using the Searchlight?

190 Tons High T

RELAYING RAIL

60 lb.—5¾-in. height; I. S. Co.'s Section No. 6012

Immediate shipment.

ARTHUR S. PARTRIDGE, 415 Pine St., St. Louis, Mo.

POSITIONS VACANT

MASTER mechanic for a hundred-car road, city and interurban service. Must be strictly sober and capable of handling men efficiently. Ability to maintain equipment at a high standard a necessary qualification. State salary expected. P-157, Elec. Ry. Journal, Philadelphia.

MANUFACTURER wants draftsman or engineer familiar with car design, able to work into sales department. State experience and salary. P-166, Elec. Ry. Journal, Chicago.

THREE good pitment wanted, 45c. per hour, eight hours, time and half overtime, good working conditions. Will refund one-half of railroad fare after six months' service. Reference first letter. P. 155, Elec. Ry. Journal, San Francisco.

WORKING carbarn foreman for a small street railway system in Colorado wanted. Man must be familiar with armature winding and competent to do and direct all carbarn work. Address P-163, Elec. Ry. Journal, Chicago.

POSITIONS WANTED

ACCOUNTANT ten years' experience, thoroughly conversant with Interstate Commerce Commission and Public Service Commission requirements desires position where ability will further advancement. PW-158, Elec. Ry. Journal.

ARE you interested in a way engineer roadmaster who wants to become identified with the manufacturing and sale of street railway materials; 18 years' practical experience, now making good. Under forty. Has executive ability and initiatve. PW-162, Elec. Ry. Journal.

ENGINEER Maintenance of Way and Construction Engineer, technical, 15 years' experience, street and interurban railways, all types track construction, designs railway structures. Extensive valuations. Age 36; married. References exchanged. PW-165, Elec. Ry. Journal, Chicago.

FOREMAN of shops and equipment city and high-speed interurban. Thoroughly familiar fith type M and HL control, straight and automatic air; now employed but considers making change. PW-159, Elec. Ry. Journal, Chicago.

POSITIONS WANTED

GENERAL auditor or secretary-treasurer Public Utility Company wants position. Twenty years' experience gas, electric, street railway accounting. Minimum salary $3000. PW-154, Elec. Ry. Journal.

GRADUATE electrical engineer having had three years experience in the design, testing and application of electric railway equipment in the employ of a large manufacturing company of railway equipment, desires position as electrical engineer with a good electric railway company. Age 25, minimum salary, $125 per month. Best of references. Address PW-161, Elec. Ry. Journal.

MASTER mechanic wants position, man with experience both city and interurban. Can furnish best of reference. PW-160, Elec. Ry. Journal, Cleveland

SUPERINTENDENT, Dispatcher or Inspector of Transportation by a young man with (17) seventeen years of successful experience in all branches, including the making of time tables. PW-164, Elec. Ry. Journal, Philadephia.

FOR SALE

RAILS

Nine miles 60-lb. steel rails, 4-in. base, 4½ in. high, practically as good as new, with fastenings. Five and one-half miles 60-lb. Joliet rails with fastenings, first-class relaying condition. Twenty-one miles 000 trolley wire. Fourteen miles wire hangings.

Two good electric interurban

CARS

One 130-k.w. D.C.

GENERATOR

For prices and particulars address

W. W. BOTTS, Treasurer,
Mexico, Missouri

MACHINERY FOR SALE

1—Tandem Compound Corliss

ENGINE

500 hp.

1 A. C.

GENERATOR

General Electric, 250-kw., 5500-volt, 3-phase class 24, 25-cycle, 125 r.p.m.

1 D. C.

GENERATOR

General Electric, 225-kw. 600-volt, class 24, 125 r.p.m.

Generators are direct connected with engine

Address, **C. J. SWIFT,** *Purchasing Agent*
C. N. S. & M. R. R., Highwood, Ill.

WANTED—To Lease

TROLLY PARK

by parties having fifteen years' experience in management of one of the largest trolly parks in the country. Will lease outright or on a percentage basis. Address

E. W. MURPHY
100 Hudson Street, New York City

FOR SALE

1—Rice & Sargent Cross Compound

ENGINE

complete with condenser, direct connected to 360 kw. General Electric

GENERATOR

Specifications of Engine:

High pressure cylinder 16 in. bore.
Low pressure cylinder 32 in. bore.
Stroke 42 in. Revolutions 120.

Specifications of Generator:

General Electric 360 kw.
525 volts, direct current.
Serial No. 53907, type MP.
Form H., class 8.
Amperes 688,
Volts 500, no load; Volts 525, full load.

This generating is set in first-class condition and ready for immediate shipment. *Will be sold at a very reasonable figure.* Outfit may be seen at our Ansonia plant.

FARREL FOUNDRY & MACHINE CO.
Ansonia, Conn.

FOR SALE

EQUIPMENT

10 large Cars fitted with G.E. equipment.

3 large cars fitted with Allis-Chalmers equipment (seating capacity for both, 42 passengers). Constructed by Preston Car and Coach Company, Preston, Ontario.

2000—13-in. Bonds.

1600 pairs 80-lb. Continuous Rail Joints, A.S.C.E. Section.

571 Rail Braces.

Plans and specifications can be supplied by

STREET RAILWAY DEPARTMENT
Edmonton, Alberta, Canada

Warning!

One of our Searchlight advertisers—a draftsman—received a check to cover traveling expenses, from a prospective employer in a distant city.

Following a brief interview, payment on the check was stopped because the applicant proved an unpromising prospect for the swindler.

The prospective employer referred to is the same man who was exposed in *Engineering News* over 20 years ago and who has recently been offering men in different parts of the country employment as chief engineer upon receipt of a specified amount to pay for stock in his concern.

We urgently recommend that advertisers take precautions to protect themselves against this new form of abuse and where evidence of it develops to communicate with the proper authorities.

Searchlight Department

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors

Acetylene Service & Apparatus
Oxweld Acetylene Co.

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Holden & White, Inc.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improvement Co.

Armature Shafts
Laclede Steel Co.

Automobiles and Buses.
Brill Co., The J. G.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles, Car Wheel.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
Laclede Steel Co.
National Railway Appliance Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
Electric Service Supplies Co.
International Register Co., The

Batteries, Dry.
Johns-Manville Co., H. W.
Nichols-Lintern Co.

Batteries, Storage.
Electric Storage Battery Co.

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Ajax Metal Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
More-Jones Brass & Metal Co.
St. Louis Car Co.
Westinghouse Elec. & M. Co.

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Holden & White, Inc.

Bearings, Roller and Ball.
Gurney Ball-Bearing Co.

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Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

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Niles-Bement-Pond Co.
Reading Specialties Co.
Zelnicker Sup. Co., W. A.

Boilers.
Babcock & Wilcox Co.

Boiler Cleaning Compounds.
Johns-Manville Co., H. W.

Boiler Coverings.
Johns-Manville Co., H. W.

Boiler Tubes.
National Tube Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
Imperial Brass Mfg. Co.
Ohio Brass Co.
Oxweld Acetylene Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Lincoln Bonding Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

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McGraw-Hill Book Co., Inc.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

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Hubbard & Co.
Lindsley Bros. Co.
Ohio Brass Co.

Brake Adjusters.
Holden & White, Inc.
Westinghouse Traction Brake Co.

Brake Shoes.
Amer. Brake Shoe & Fdry. Co.
Barbour-Stockwell Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
St. Louis Car Co.

Brackets and Cross Arms
Electric Railway Equipment Co.

Brakes, Brake Systems and Brake Parts.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
National Brake Co.
St. Louis Car Co.
Westinghouse Trac. B. Co.

Brooms, Track, Steel or Rattan.
Paxson Co., J. W.
Zelnicker Supply Co., W. A.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.

Brushes, Carbon.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
United States Graphite Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
United States Graphite Co.

Bushings, Case Hardened & Manganese
Bemis Car Truck Co.

Cables. (See Wires and Cables.)

Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc.—See those headings.)

Car Trimmings. (For Curtains, Registers, Doors, Seats, etc.—See those headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Kuhlman Car Co., G. C.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.
Wason Mfg. Co.

Cars, Second Hand.
Electric Equipment Co.

Cars, Self-Propelled.
Electric Storage Battery Co.
General Electric Co.

Castings, Brass, Composition or Copper.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
Horne Mfg. Co.
More-Jones Brass & Metal Co.

Castings, Gray Iron and Steel.
American Steel Foundries
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
St. Louis Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
Amer. Brake Shoe & Fdry. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Electric Service Supplies Co.
Holden & White, Inc.
Horne Mfg. Co.
Ohio Brass Co.
Wood Co., Chas. N.

Ceiling, Car.—(See Head Lining.)

Circuit Breakers.
Automatic Reclosing Circuit Breaker Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Clamps and Connectors for Wires and Cables.
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

Cleaners and Scrapers Track.—(See also Snow-Plows, Sweepers and Brooms.)
Brill Co., The J. G.
Ohio Brass Co.

Clusters and Sockets.
General Electric Co.

Coal and Ash Handling.—(See Conveying and Hoisting Machinery.)

Coasting Recorders.
Railway Improvement Co.

Coil Banding and Winding Machines.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Coils, Armature and Field.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Coils, Choke and Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
International Register Co., The
Johnson Fare Box Co.

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.
Wood Co., Chas. N.

Commutator Truing Devices.
General Electric Co.

Commutators or Parts.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Compressors, Air.
General Electric Co.
Westinghouse Trac. B. Co.

Concrete Mixers.
Jaeger Machine Co.

Condensers
General Electric Co.
Westinghouse Elec. & M. Co.

Conduits, Underground.
Johns-Manville Co., H. W.

Connectors, Solderless.
Westinghouse Elec. & Mfg. Co.

Controller Regulators.
Electric Service Supplies Co.

Controllers or Parts.
Columbia M. W. & M. I. Co.
General Electric Co.
Horne Mfg. Co.
Johns-Manville Co., H. W.
Westinghouse Elec. & Mfg. Co.

Controlling Systems.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Converters, Rotary.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Conveying and Hoisting Machinery.
Columbia M. W. & M. I. Co.
Green Engrg. Co.

Cord, Bell, Trolley, Register, etc.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The
Roebling's Sons Co., John A.
Samson Cordage Works

Cord Connectors and Couplers.
Electric Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car.
Brill Co., The J. G.
Ohio Brass Co.
Van Dorn Coupler Co.
Westinghouse Trac. B. Co.

Couplings, Conduit.
Horne Mfg. Co.

Cranes. (See also Hoists.)
Niles-Bement-Pond Co.

Creosoting. (See Wood Preservatives.)

Cross Arms. (See Brackets.)

Crossing Foundations.
Balkwill Manganese Crossing Co
International Steel Tie Co.

Crossing Signals. (See Signals, Crossing.)

Crossings, Track. (See Track, Special Work.)

Culverts
American Rolling Mill Co.
Bark River B. & Culvert Co.
California Cor. Culvert Co.
Canada Ingot Iron Co., Ltd.
Canton Culvert & Silo Co.
Coast Culvert & Flume Co.
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1500-ton creosoted coal-bunker. Points of contact of all timbers treated with Carbosota previously to assembling and erecting. Carbosota also applied to the exterior instead of paint. *(Courtesy The Milwaukee Electric Railway & Light Co.)*

Some Advantages of Creosoted-Timber Structures

1. Creosoted structures are economical.

2. Their life is greater than untreated structures under equal conditions.

3. Creosoting will result in a reduction of from 10 to 25 per cent. (more in special cases) in the *annual cost* of such structures.

4. Repairs due to decayed timber are practically eliminated.

5. The economy derived from proper creosoting naturally varies with the method of treatment used, species of wood employed, and mechanical conditions involved, *but creosoting always pays* where wood is exposed to decay.

6. The application of Carbosota Creosote Oil as a paint is *very great economy*. It costs but a fraction of the price of a good grade of paint, lasts longer, does not crack or peel off, and preserves the wood. Its color is a pleasant nut-brown that blends perfectly with the usual atmosphere of industrial plants. During the next decade or more, economical use of raw materials is imperative. Eliminate at least one item of preventable waste by creosoting wood and protecting it from decay.

Barrett's Carbosota Grade-One Liquid Creosote Oil

Carbosota Creosote Oil is a pure coal-tar creosote which has been especially developed for non-pressure treatments. It is the universally recognized standard.

Carbosota Creosote Oil meets Government requirements. It is economical, ready for use, conveniently packed, and obtainable everywhere.

(Green wood cannot be effectively creosoted by non-pressure processes. It should be air-dry. In regions of moist, warm climate, wood of some species may start to decay before it can be air-dried. Exception should be made in such cases and treatment modified accordingly.)

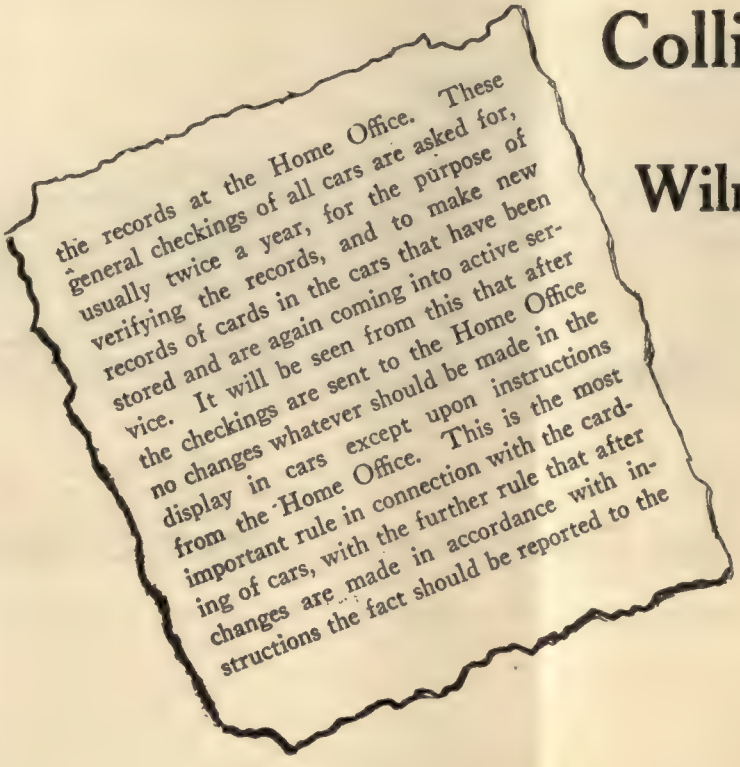
Technical assistance and information regarding the CARBOSOTA *treatment free upon request.*

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria

THE BARRETT COMPANY, Limited

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.



Collier Service at Wilmington, N. C.

This little extract from our instructions on "Checking Cars" is but one of the many details which go to make up that entirety called "Collier Service."

There is in every Collier-Carded Community at least one Collier man to see that the cards are placed, retained, changed or removed according to contract.

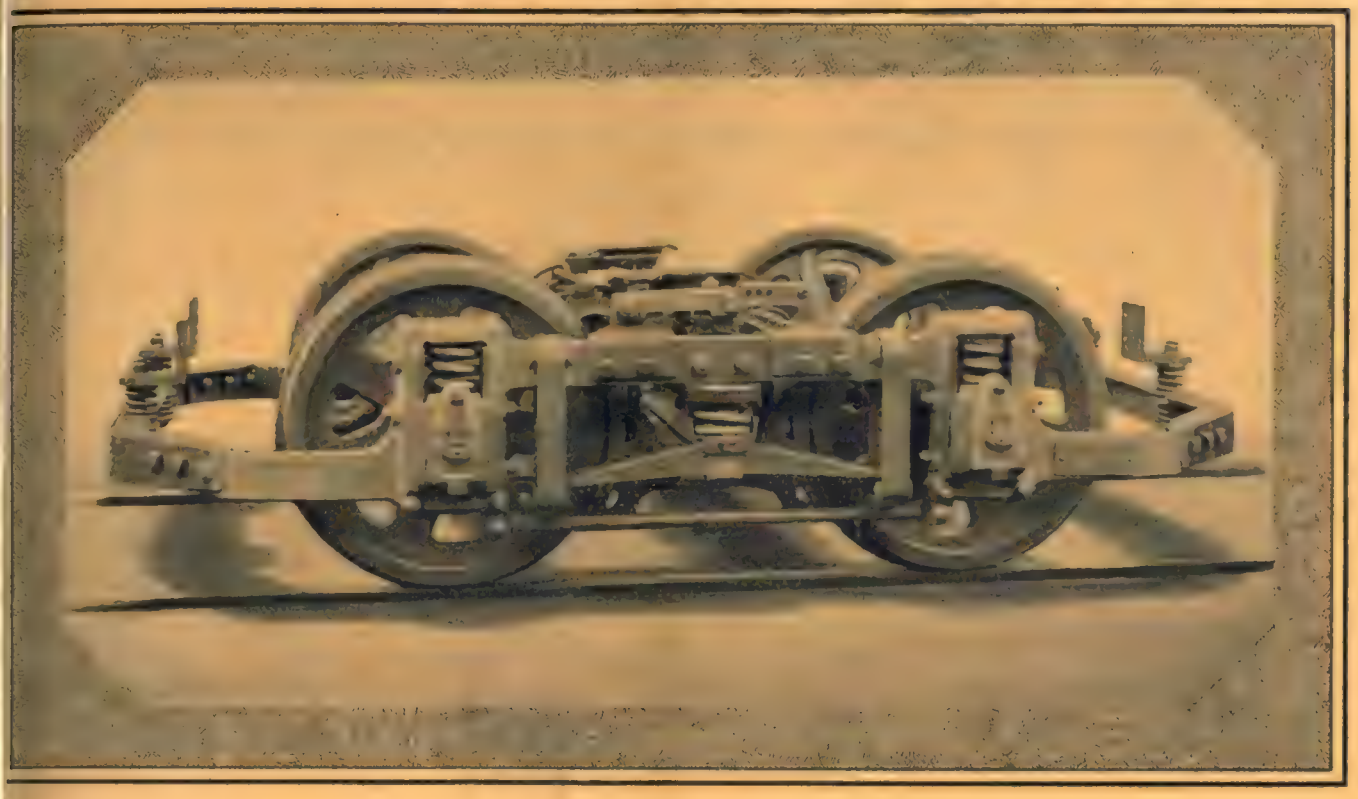
The number of these interchanges runs up into millions annually, and this work is performed just as punctually and faithfully on a road like Wilmington with a few score cars as it is on the very largest systems which have Collier Service.

Such care is absolutely necessary in maintaining the value of the car cards to the advertiser, which means maintaining the value of the advertising space as a source of revenue to the railway company.

Barron G. Collier INCORPORATED

Candler Building

220 West 42nd Street, New York City



For Four-Motor City Cars

THIS truck has exactly the same easy riding spring system as the Brill standard single-motor truck, including the extra set of spirals under the bolster arranged to automatically come into play under light loads—the "graduated spring system," the immense value of which is nowadays so widely appreciated. Also it has the "bolster guide" which is the link device that holds the bolster upright and makes it "float" on the bolster springs instead of being held between chafing plates with their binding and checking effect on the springs. These two special features, that have so vastly improved the riding qualities, are regular parts of the equipment of all Brill standard pivotal trucks. Bulletin 225 fully describes the 76-E Truck.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

G. C. KUHLMAN CAR CO.
CLEVELAND, OHIO

BRILL

AMERICAN CAR COMPANY
ST. LOUIS, MO.

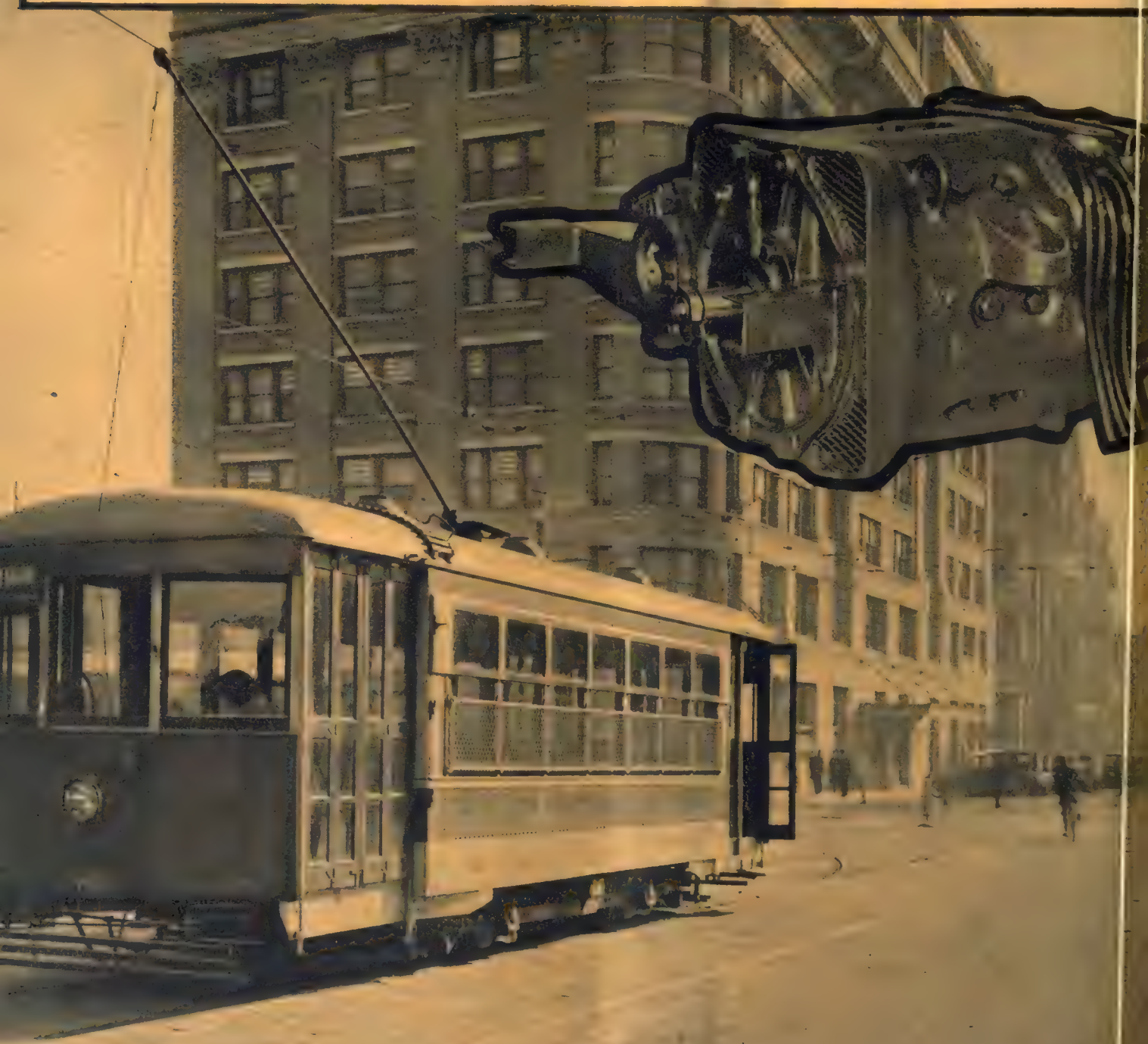
WASON MANUFACTURING CO.
SPRINGFIELD, MASS.

GE-258 Motor

On the Light-Weight Safety Cars at Austin, Texas

Like Fort Worth, Dallas and Houston, Austin, the capital of Texas, is practicing the gospel of More Service at Less Cost with the aid of the Light-Weight Safety Car equipped with GE-258 Motors. There is no town too small and no cities too large to apply widely these small-unit, big-output cars.

25-4



General Electric Company

General Offices:
Schenectady, N. Y.

Sales Offices
in all large cities

Overhead Construction of the New York Connecting Railroad

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Company, Inc., June 1, 1918

HOUSTON LYCEUM & CARNEGIE LIBRARY HOUSTON, TEXAS.

An Opportunity to Buy New Hand Brakes



Owing to pressure of work at our factory, for the United States Navy and the necessity of removal to larger quarters, we have for quick sale a quantity of Horne Double Acting Brakes. This is an unusual chance to obtain well-known standardized hand brake equipment for new cars or reconstructed old cars at an attractive price and immediate delivery.

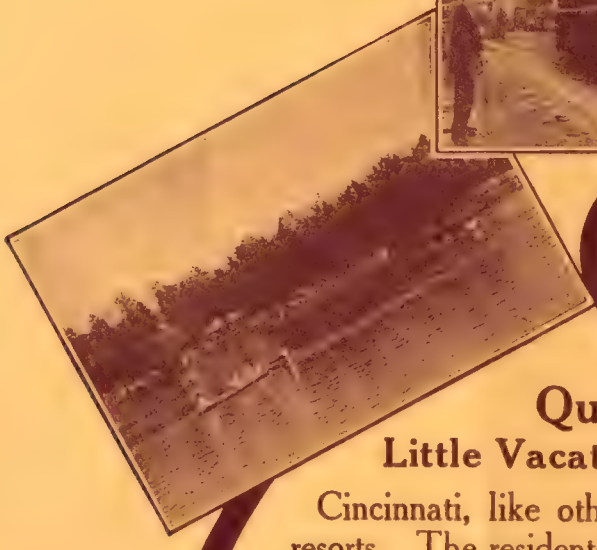
Quick Action is Necessary

HORNE MFG. COMPANY

50 Court Street, Brooklyn, N. Y.

Westinghouse







Queen City's
Little Vacations Across the Ohio

Cincinnati, like other large cities, has recreation resorts. The residents derive most pleasure from short, but frequent, outings into the delightful country known as the Kentucky Highlands.

In its endeavor to best serve its patrons, and to provide for their comfort, The South Covington & Cincinnati Street Railway Co. have placed in service twenty-five new, all-steel, double-truck, 24-inch wheel, interurban cars, weighing complete with equipment, 15 tons. Each car is equipped with Westinghouse No. 506 Motors. The motors rate 25 h.p. at 600 volts, and weigh only 900 pounds.

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.
Sales Offices in All Large American Cities



Vol. 51, No. 22 New York, June 1, 1918 Pages 1039 to 1080

Electric Railway Journal

H. W. BLAKE, *Editor*

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Westinghouse Turbine Generator



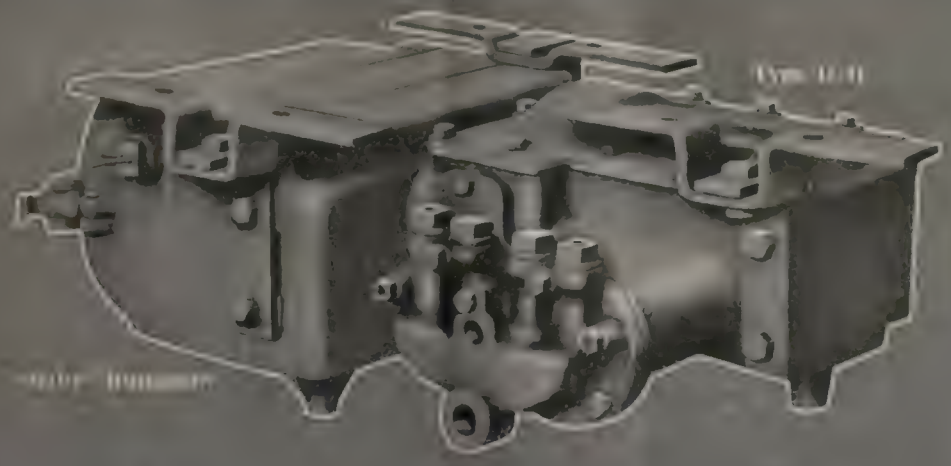
Westinghouse Steam Turbine Generators are built in capacities up to 70,000 kilowatts.

They are unsurpassed in dependability and economical operation.

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.

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W
WESTINGHOUSE ELECTRIC

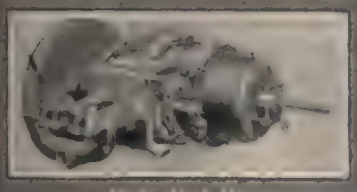


Air Compressors

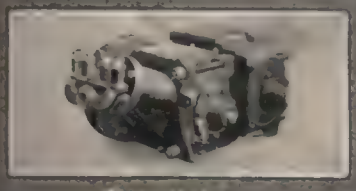




Westinghouse Air Compressors cover a broad field of service. Meet all operating conditions. Can be fitted to any current. Capacities range from 10 to 150 cubic feet per minute. Write to our nearest office.











Brake Building our Business for a Lifetime

Westinghouse Traction Brake Company

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Los Angeles, Cal.
Mexico City
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Maine —— Florida

Recognition of the Safety Car

To meet the diversified requirements of the

Four Corners of the Nation

has been completely and readily effected through the use of

Safety Car Control Equipment

Ask for full information concerning this development of nation-wide interest and application

Texas —— Washington

SAFETY CAR DEVICES CO.

Main Office—Boatmen's Bank Bldg., ST. LOUIS

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Ry. Exch. Bldg.

NEW YORK
City Invest. Bldg.

PITTSBURGH
Westinghouse Bldg.

CANADA—Canadian Westinghouse Co., Ltd., Hamilton, Ont.

B PRODUCTS



Guarding the Grade Crossings with National Trolley Guard

The picture shows a grade crossing with particularly hazardous possibilities—but it is protected by National Trolley Guard.

National Guard is a conductor in the form of an inverted trough of open wire mesh. If the trolley wheel leaves the wire the Guard catches it and furnishes current to carry car and passengers safely out of the danger zone.

National Guard is on duty at hundreds of crossings. After a company has once watched the first installation it usually protects the rest of its crossings with National Guard.

"Guarding the Grade Crossings" is a new booklet which describes National Guard and illustrates various installations. If you have not already received a copy, write today.

The Ohio Brass Company, Mansfield, Ohio

New York Philadelphia Pittsburgh Chicago Los Angeles San Francisco

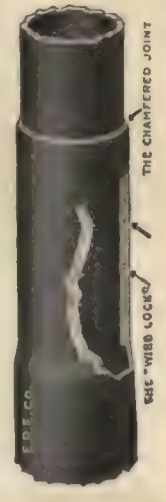
Winnipeg Has 266 Elreco Combination Poles



Among this progressive Canadian city's distinctive features are its broad, handsome business and residential streets.

The use of Elreco Combination Poles was a happy joint solution of the railway and the lighting problem; for the same poles which carry the trolley span-wires also support the lighting fixtures.

Separate lamp standards, which would obstruct the curb line, are not needed; and their first cost and installation cost is saved.



Elreco Poles
Have Two Special Features

which cannot be found in any other tubular poles. The "Wire Lock" Swedge Joint is a sure prevention of "telescoping"—and the Chamfered Joint sheds water, thereby preventing rusting and consequent weakness at the joint. These poles combine lowest cost, lightest weight, least maintenance and greatest adaptability.

Ask us for the *Elreco* Catalogs.

Electric Railway Equipment Company
Cincinnati, Ohio

New York: 30 Church Street

How to SAVE $4300 per Mile

Wooden Ties [*Per 100 Feet of Track*]		Int. Steel Ties	
20 tie rods	$17.00	16⅔ steel twin ties	$116.66
50 ties	42.50	134 cast malleable clips	10.72
100 tie plates	45.00	15 cu.yd. concrete	87.75
100 lb. spikes	4.00	15.2 cu.yd. excavation	19.00
28.3 cu.yd. concrete	165.56		
34 cu.yd. excavation	42.50		
Total	$316.56	Total	$234.13

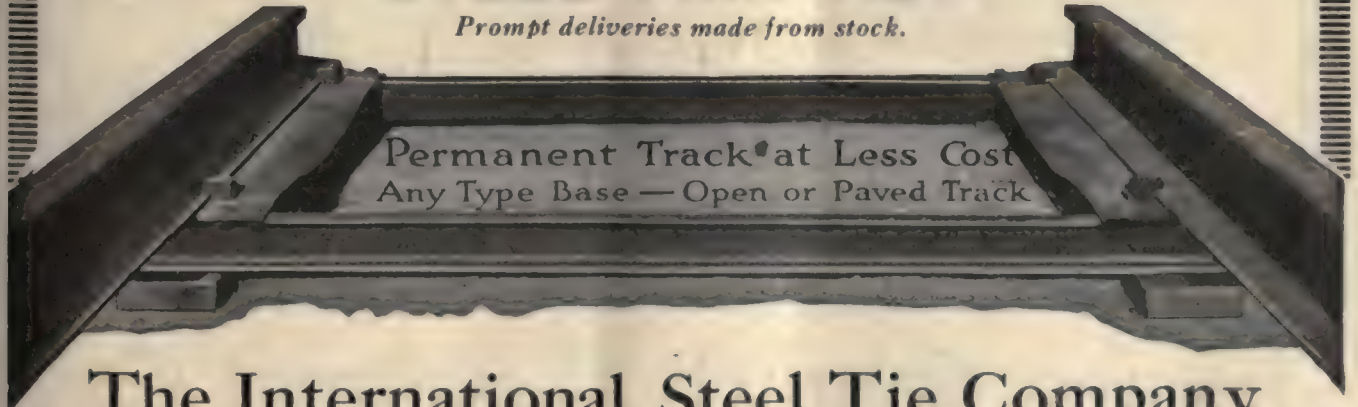
Saved per 100 feet..... $82.43
Saved per Mile of track.. 4352.30

And Besides: No tie rods; no tie plates; no cross bonds; narrow trench (7 ft. instead of 9 ft.); 50% labor saved in track construction below base of rail. Concrete foundations bear up well under heaviest traffic.

Ask us for proofs

INTERNATIONAL
STEEL TWIN TIES

Prompt deliveries made from stock.



The International Steel Tie Company

Manufacturers of Steel Twin Ties and Crossing Foundations

General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

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AUTOMATIC BLOCK SIGNALING for PROTECTING HIGH SPEED TRAFFIC

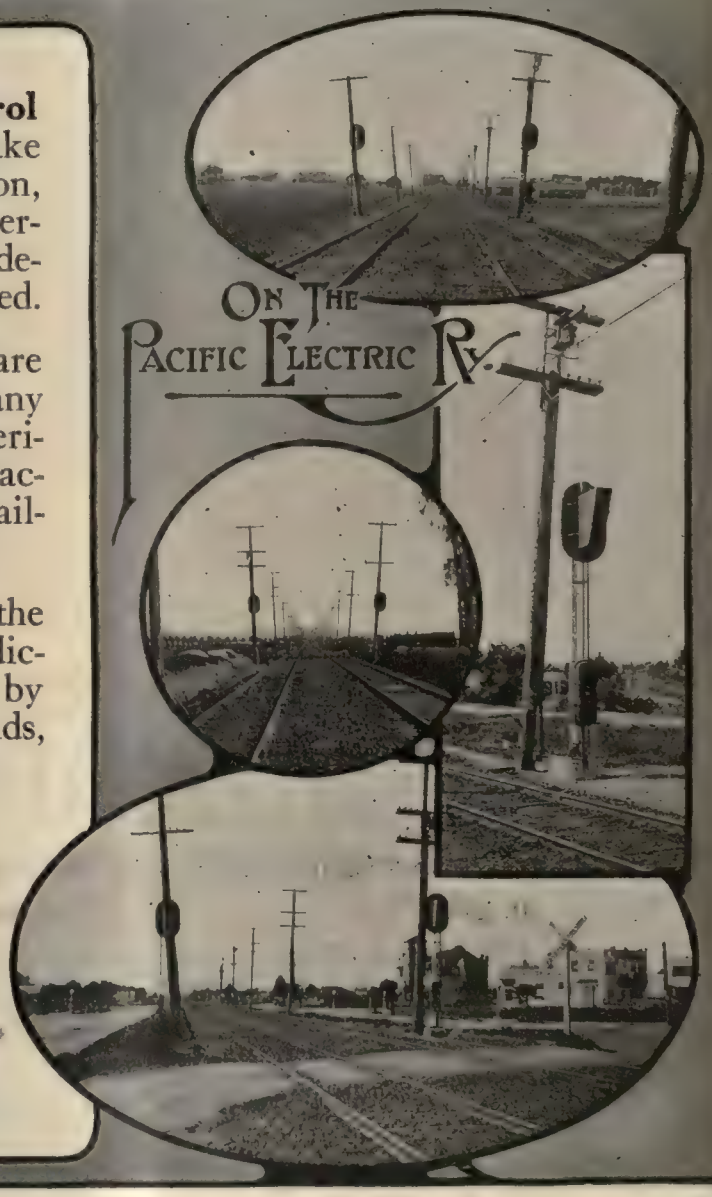
Schemes of Signal Control are in use or can be devised to take care of any operating condition, but the ultimately satisfactory performance of a signal system is dependent upon the apparatus used.

Union Signal Appliances are tried and proven. This company has had over thirty years' experience in the design and manufacture of apparatus intended for railway signaling exclusively.

Results Obtained on the Pacific Electric Railway are indicative of the service given by UNION signals, relays, bonds, transformers, etc.

Pasadena Short Line: Over 6,000,000 signal functions with only 20 failures, 10 of which were due to lamps burning out.

Venice Short Line: Over 2,000,000 signal functions with only 25 failures, 13 of which were due to lamps burning out.



Union Switch & Signal Co.

SWISSVALE, PA.

Trade Mark

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Peoples Gas Bldg. CHICAGO
Canadian Express Bldg. MONTREAL
Candler Annex ATLANTA
Railway Exchange Bldg. ST. LOUIS MO.
So. Pacific Bldg. SAN FRANCISCO

Represented by the GENERAL ELECTRIC CO. in Australasia, South Africa and Argentina

Trade Mark

Keystone Car Signs

Standard on the Seattle Municipal Railway



The popularity of Keystone and Hunter types of illuminated car signs is not limited by geography. They are just as greatly appreciated on the shores of the Pacific as on the Atlantic shores.

So it's not surprising to find Keystone car signs the standard of the Seattle Municipal Railway which appreciates that car signs legible beyond braking distance cuts down unnecessary stops (due to misunderstanding by intending riders) and ADVERTISE THE SERVICE.

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

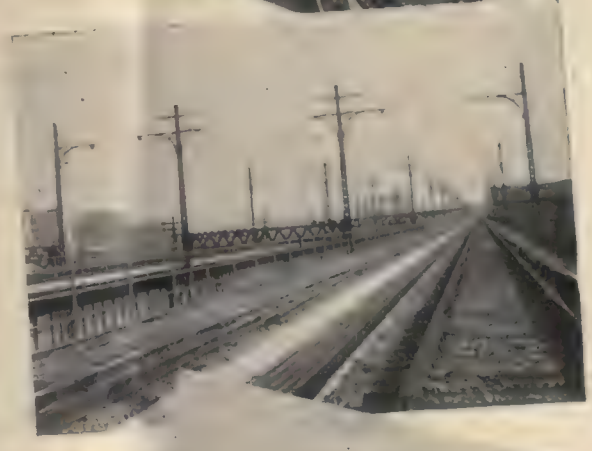
CHICAGO
Monadnock Bldg.

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Phono-Electric
Phono-Electric









When the Hell Gate Bridge was built, the New York, New Haven & Hartford and the Pennsylvania Railroads had already learned by experience that PHONO-ELECTRIC was the trolley wire which would stand the pounding of the pantographs of the big locomotives required to haul the trains on such gradients. Their experience had demonstrated that PHONO-ELECTRIC would deliver the 11,000-volt current to the giant pantographs without burning, corroding or pitting—that it would stand up under the unusual requirements of this vital link in their lines.

That is why PHONO-ELECTRIC was installed over the lines of the N. Y. Connecting Railroad.

Bridgeport Brass Company
Bridgeport Connecticut

The Largest Order for Slack Adjusters Ever Recorded

Operation

When brakes are applied, the strain on the threaded shaft is great enough to keep the brake-adjusting screw from turning. Therefore, when brake lever travel exceeds a distance predetermined by the adjusting finger, the fulcrum pin engages this finger and advances the rocker arm, which rotates the clutch sleeve only, in a right-hand direction.

When brakes are released, the brake adjusting screw is free to turn, so that when fulcrum pin engages the rocker arm and carries it back, the clutch sleeve, and brake-adjusting screw are turned as a unit in a left-hand direction, thus lengthening the connection and taking up the slack, if any.

To replace worn shoes, a wrench is applied to hexagon nut and brake-adjusting screw turned back sufficiently to give necessary slack. When the new shoes are in place, only enough slack need be taken up by hand to make the car safe to go on the road. The adjuster thereafter takes care of all adjustments until the shoes are worn out.

Philadelphia Orders 4298 Anderson Brake Adjusters

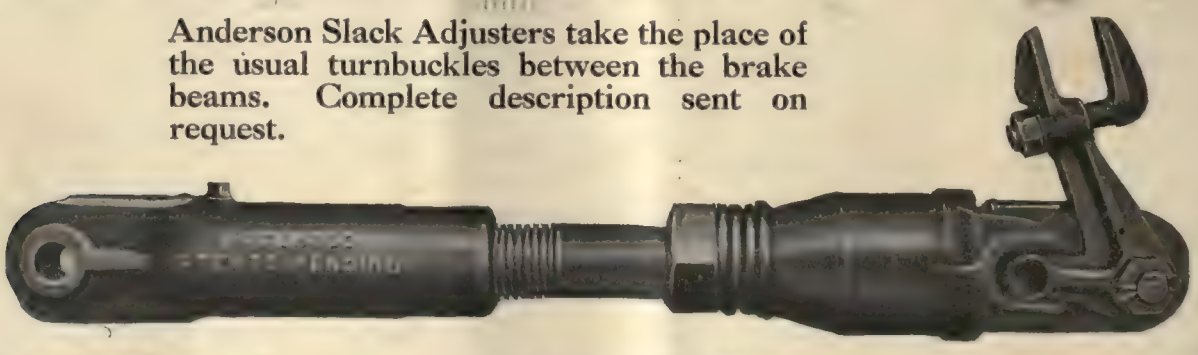
In February, 1913, more than 5 years ago, the Philadelphia Rapid Transit Company installed two Anderson Automatic Brake Slack Adjusters on Brill 39-E trucks. Experience showed that with these adjusters no adjustment of brakes was necessary during the entire life-time of brake shoes.

This test was made in competition with other brake adjusters and the Anderson Adjuster proved to be the most satisfactory type. Consequently this company ordered 4298 Anderson Adjusters, sufficient to equip 2149 cars.

The Company officials were convinced that the use of Anderson slack adjusters would greatly reduce labor previously necessary for inspection and adjustment of brake rigging, reduction in brake shoe wear, less wheel wear and less armature maintenance cost.

(*These facts, based on an article in the Electric Railway Journal, March* 30, 1918.)

Anderson Slack Adjusters take the place of the usual turnbuckles between the brake beams. Complete description sent on request.



Holden & White Inc.

817 Fisher Building, Chicago, Ill.

National Railway Appliance Co., New York and Washington; C. E. A. Carr Co., Toronto; W. M. McClintock, St. Paul; Alfred Connor, Denver; O. H. Davidson Equipment Co., Salt Lake City; F. F. Bodler, San Francisco; S. I. Walles, Los Angeles.



Would you build a skyscraper with a copper frame?

Hardly, although it could be done.

Inasmuch as copper is less than half as strong as steel, the extra weight of metal plus the extra cost per pound for the copper would bring costs to where even present day war prices would look cheap.

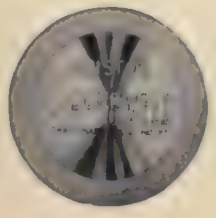
The real functions of copper in electrical transmission wires are *conductivity* and *immunity from corrosion.*

ARISTOS COPPERWELD
COPPER CLAD STEEL WIRE

(Direct from the product of the Copper Clad Steel Co., Pittsburgh)

gives these with the same certainty as solid copper, but the steel core produces the needed extra strength without wasteful addition to the copper section. For equal duty, Aristos Copperweld is therefore smaller in outside diameter and *much less* in cost. Putting it the other way, Aristos Copperweld of equal diameter, permits the *safe* use of fewer poles and insulators, with consequent saving in installation, and maintenance.

The exact saving in initial cost, poles, insulators, labor of placing and subsequent maintenance are all matters that can be very definitely estimated in advance.



Let our engineers explain in detail, and if you follow their advice, your good judgment will soon be vindicated.



PAGE STEEL AND WIRE COMPANY

MONESSEN, PA.,
Established 1883

General Sales Office:
Page Steel and Wire Co.
30 Church St., New York

Western Sales Office:
Steel Sales Corporation
Chicago, Ill.

2

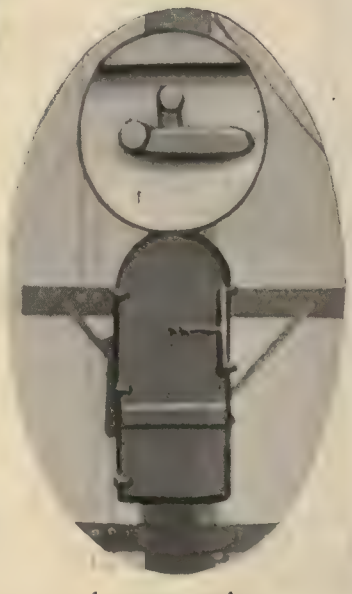


CHAPMAN

Automatic Signals



Clear and Distinct



Signals that work at all times

The reliability of the Chapman Automatic Track Relay Signal System to operate under all conditions of time or weather makes them the choice of important interurban electric railways. A red semaphore, 18 in. long, works on a white disk 24 in. in diameter. In operation it assumes three positions—**diagonal** when the block is clear, **perpendicular,** when there is a car in the block going away from you, and **horizontal,** when a car is approaching from the other end of the block. The semaphore can be seen a long distance clearly and distinctly—in fact, there's no uncertainty with Chapman Signals. When desired, hooded colored lights as indicators will be furnished. Wherever operated Chapman Automatic Signals give highly satisfactory service—they are dependable, economical as to upkeep, and are absolutely automatic. In many instances great savings in the running time of the cars are effected and the remarkable avoidance of accidents is extremely pleasing to the officials.

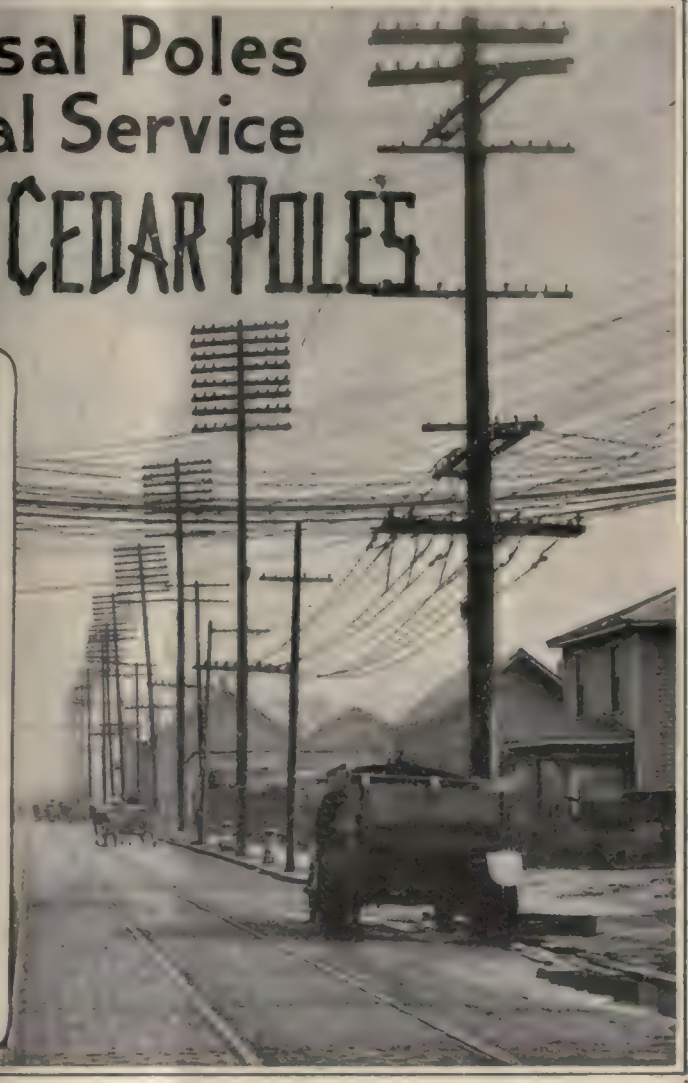
Write for information.

Charles N. Wood Company

14 Federal St., Boston, Mass.

The Universal Poles For Universal Service

WESTERN RED CEDAR POLES



Set In 1903

Photograph recently taken at Columbus, Ohio.

Poles at right are 60 and 65 ft. **Western Red Cedar** set in 1903. They carry the following load:

7—500,000 C.M.	W.P.	Stranded	
6—4/0	W.P.	Solid	all copper
14—2/0	"	"	
3—1/0	"	"	
7—No. 1	"	"	
4—No. 2	"	"	
4—No. 4	"	"	
8—No. 6	"	"	

No replacements have been necessary, and the poles are in good condition today.

Western Red Cedar Poles are the Universal Poles for Universal Service because they meet all of the requirements for any type of pole line construction in any part of America.

In every part of the country are lines of Strong, Straight, Beautiful **Western Red Cedar Poles** which have rendered good service for from 14 to 19 years and are in good condition today.

Western Red Cedar Association

Peyton Building, Spokane, Washington

Unskilled Help Can Use the Indianapolis Electric Welder

Skilled help is hard to obtain now. Machinery that is skillful must take its place. Any man with ordinary intelligence can do the work of repairing and reclaiming rails with The Indianapolis Portable Electric Welder. With it your unskilled help can fix broken, worn or guttered track, damaged switch tongues, frogs and switches.

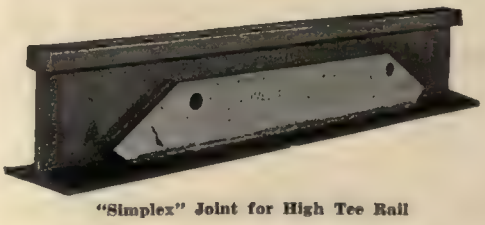
The Indianapolis Portable Electric Welder makes electrically welded rail joints instead of bolted joints. Indianapolis Joints and Bonding Plates show greater conductivity than the rail itself. They eliminate current losses.

Indianapolis Switch & Frog Company

Springfield, Ohio

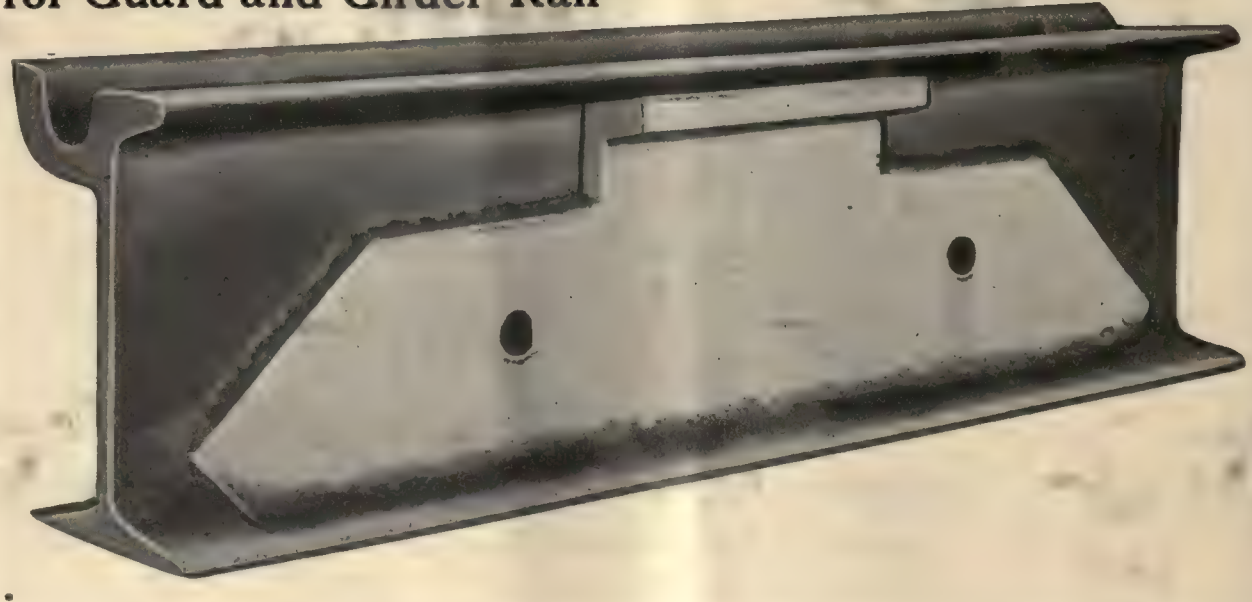
Users of Indianapolis Patented Welders, Joints and Welding Supplies Fully Protected





"Simplex" Joint for High Tee Rail

"Apex" Joint for Guard and Girder Rail





Consider the Scrap Pile

It will surprise you how much of it can be reclaimed for active service by means of one of these

ERICO
Arc Welding Rheostats

The rheostat weighs 85 lbs. and will operate on voltages from 250 to 750 with a current regulation of from 60 to 200 amperes in steps of about 15 amperes. We also make standard equipments for 110 and 220 volts, and special equipments for any voltage or current capacity.

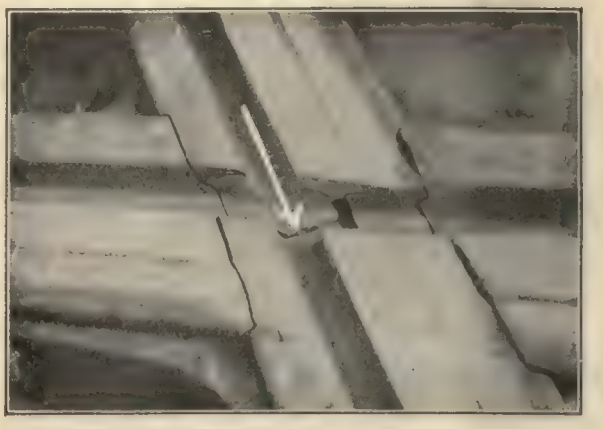
Discarded armature shafts, axles, gear casings, flat wheels and gears are only a few of the articles that can be rescued from the scrap pile and made to serve you.

Cupped rail joints, worn switch points and fish plates may be built up or welded by taking the current directly from the trolley wire.

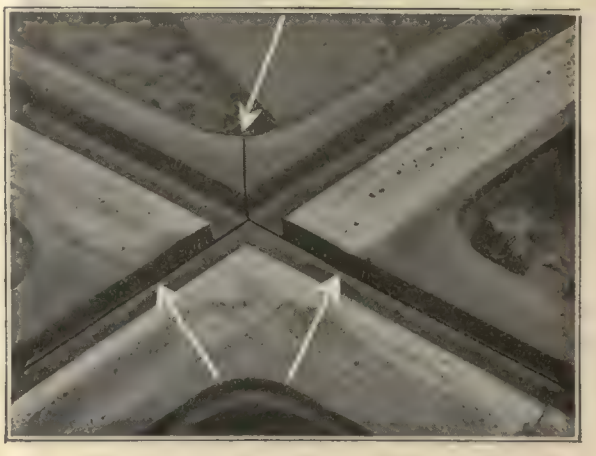
By the addition of a circuit breaker this same rheostat can be used with the ERICO Portable Welder for installing Electric Weld Rail Bonds.

Write for full details and prices.

The Electric Railway Improvement Co.
Cleveland



What Happens to a Rolled Rail Crossing



Joints in Balkwill Articulated Cast Manganese Crossings are life savers. They positively prevent breakage at flangeway intersections, permitting 100% wear before renewal

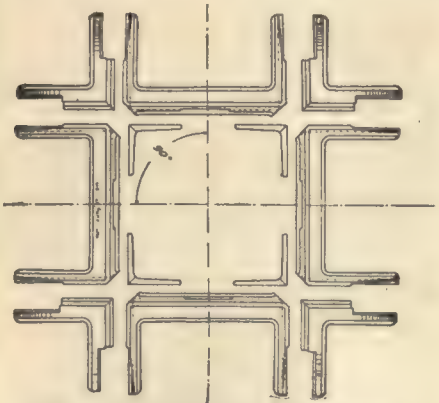
Why Balkwill Articulated Cast Manganese Crossings Are Superior to Rolled Rail Crossings

This picture at the left shows where breaks in the main steel filling or backbone of rolled rail crossings are usually found.

These breaks are unavoidable because of the lack of flexibility of the rolled steel filler at the flangeway intersection.

In the Balkwill Articulated Cast Manganese Crossing the difficulty is corrected by placing scientifically designed joints at the very places where breakage formerly occurred.

The lower first cost of a rolled rail crossing is therefore not a lower overall cost because it takes several rolled rail crossings to equal the life of one Balkwill Articulated Cast Manganese Crossing. Therefore the Balkwill Crossing is the cheapest in the long run. It gives



Joints at the flangeway intersections of Balkwill Articulated Cast Manganese Crossings positively eliminate breakage

MORE WEAR PER DOLLAR THAN ANY OTHER CROSSING YOU CAN BUY

It saves interruptions to traffic, makes less demand on labor, which is now so scarce, and also reduces the cost of making replacements frequently.

Write us for data on existing installations. If your special work manufacturer cannot get prompt deliveries of manganese castings or has not taken out a license to manufacture these crossings, DON'T ACCEPT A SUBSTITUTE but write us direct and we will see that your requirements are taken care of.

Order Balkwill Articulated Cast Manganese Crossings Direct from Your Special Work Manufacturers

The Balkwill Manganese Crossing Co.

506 Williamson Building, Cleveland, Ohio

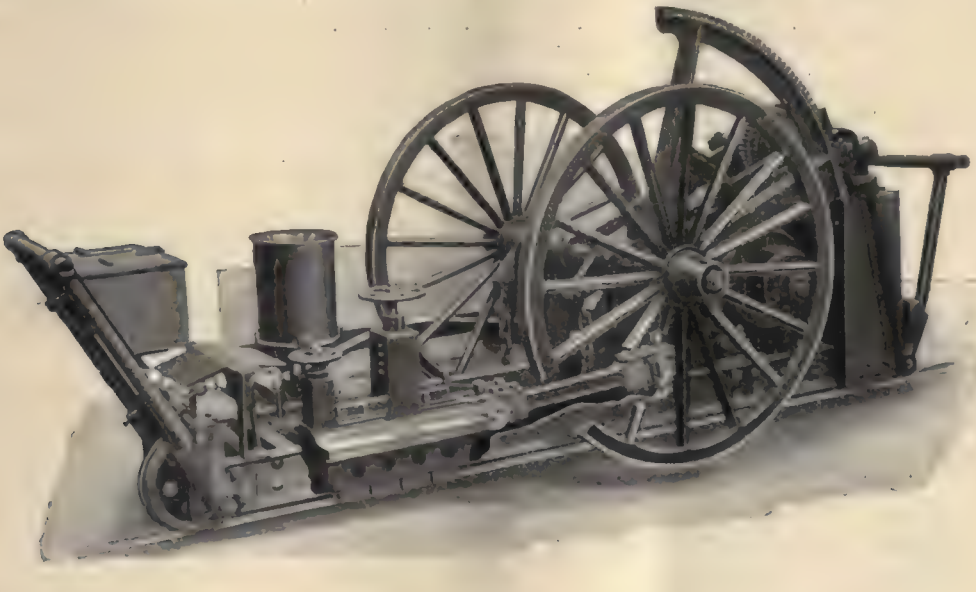
It Costs $2000 a Year Just to "Carry" a Mile of Track

Forty thousand dollars a mile is a conservative average figure for the cost of building track in paved streets.

This is not a "war time" price. Present emergency conditions do not figure in it.

At that figure the carrying charge for interest on the investment alone is at 5%, $2000 a mile per year.

Corrugations and cupped joints are the most destructive germs of track decay, not merely of the rail but of track foundations as well.



If the Use of a Reciprocating Track Grinder

will kill these germs when they first begin to breed and thereby lengthen the life of your track by from three to six or seven years what is a Reciprocating Grinder worth in view of the above figures?

It is worth a lot more than it costs and the experience of a hundred companies proves it.

A Reciprocating Track Grinder used on your tracks means *great big* future economies.

We will be glad to prove that fact to you on your own tracks. Ask us to do it.

RAILWAY TRACK-WORK COMPANY

30th and Walnut Streets, Philadelphia

AGENTS: Holden & White, Inc., 343 S. Dearborn St. Chicago.

The MECHANICAL RAILWAY TIE



First Cost *and* Final Cost

Wooden ties, without any of the labor cost of laying, are cheaper, piece for piece, than Dayton Mechanical Ties—we freely admit that!

Untreated wooden ties **completely installed** with gravel ballast cost 6% more than Dayton Mechanical Ties for the same length of track.

Wooden ties, **at the end of ten years,** cost more than twice as much as Dayton Mechanical Ties.



Furthermore:

D.M. Ties are permanent.

D.M. Ties outlast the pavement.

D.M. Ties are cushioned with an asphalt base, under the wooden rail support.

D.M. Ties are attached to the rails as shown in the picture on the left.

D.M. Ties form a rigid, reinforced concrete bed, each tie resting on its own highly resilient cushion.

Your inquiry for full particulars regarding Mechanical Railway Ties will be a step in the direction of better economy. Write today.

THE DAYTON MECHANICAL TIE CO.
201 Third Street Arcade
DAYTON, OHIO

Some very good reasons for equipping your track with

Abbott Rail-Joint Plates



A SIMPLE one-piece forging which strengthens and otherwise improves ordinary angle-bar rail joints and promotes service satisfaction and low maintenance costs by virtue of highly desirable features.

Distributes the wheel load on the two joint ties with about the same action as between a short deck bridge and its piers.

Being a separate part, the plate can be harder and more elastic, and hence afford a stronger support than the steel in the angle bars.

Compels the rails to take first bearing at their ends, because of a slight camber in the plate, and then prevents deflection of the splice bars. This avoids battering of rail ends, harmful wear of splice bars and the tendency of bolts to stretch and nuts to loosen.

The flat end bearings take the place of tie plates and preserve the ties.

The upward corner lugs engage the ends of the angle bars to prevent joints from creeping off the ties, and engage the rail bases to preserve alignment if through accident, the angle bars break or come loose.

The joints may be taken out and rails removed or replaced without disturbing the plates. The plate holding spikes are permanent fastenings.

Smooth runnings track surface is maintained without constant raising and tamping of joint ties.

Abbott Plates are made in types and sizes for use on any rail section, are suitable for any two tie angle bar joint and may be punched for common or screw spikes throughout or for a combination of both. They are applicable to and equally advantageous on new, relaid or old track.

Write for our booklet "Improved Track Appliances" which describes various types of Abbott Plates and the comparative advantages of each.

Lackawanna Steel Company
LACKAWANNA, N. Y.

Atlanta Boston Buffalo Chicago Cincinnati
Cleveland Detroit New York
Philadelphia St. Louis San Francisco Havana



...or routed, the ...ld be advised as to the ...as appearing in these frames, ...ll as size.

APPEARANCE OF CARDS, COLOR EFFECT, ETC.

It is important that pains be taken to get a good color effect in the display of cards, so that each card will have as much individuality as possible and that the display will be attractive to passengers as well as advertisers. To bring this about the cards should be placed so that the dark or heavily illustrated cards will alternate with light cards, and soiled cards should be replaced by fresh, clean cards of the same advertiser.

"Work Orders" may sometimes call for the removal of a dark card to place a light card, thereby bringing two light cards together, or the opposite, bringing two dark cards together. When this occurs, the ...rangement of the cards ma... give proper color effe... a rearrangement... no changes ... on the ...

COLLIER SERVICE ITS CONCRETE MEANING

The extract reproduced with the above view of Collier Cards in one of the cars of the Roanoke Railway and Electric Company is from our "Instructions to Car Carders."

Note that no effort is spared to give SERVICE to the user of car cards down to seemingly insignificant details.

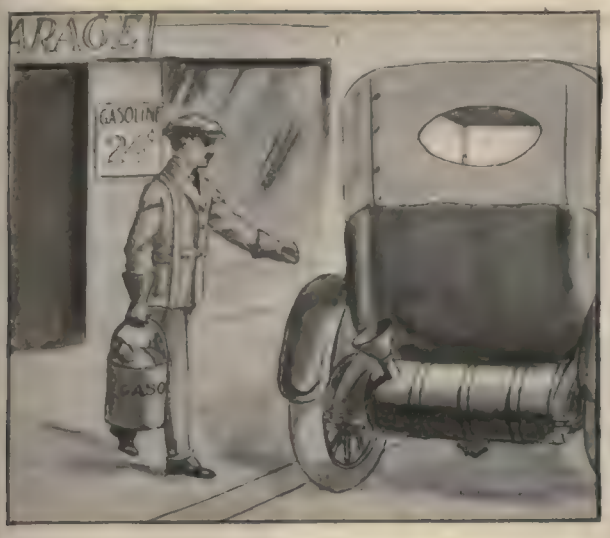
But it is this SERVICE—whether for great railways or small—that establishes confidence in car cards as an advertising medium.

And it is this confidence established so largely by Collier Service, that assures railways of a stabilized income over ten and fifteen year periods.

Barron G. Collier INCORPORATED

Candler Building

220 West 42nd Street, New York City



He Knows!



He Doesn't Know!

METER THE ENERGY!

That's what you want to save and METERING is the logical way to encourage saving

THE ECONOMY METER

is an Open-Face "Monitor" That Encourages Saving

It shows motormen in understandable figures the precise effect of indifferent handling of controller and brake.

It shows them how they waste energy by failing to accelerate and brake correctly. It discourages "fanning" brakes and coasting up hill.

It proves to them that proper coasting saves energy and improper coasting wastes it.

It does not encourage practices contrary to "Safety First." It stimulates competition with fellow workers "on the front end."

It induces very substantial savings in car propulsion energy and its records are of high engineering value.

This device enables electric railways to effect generous savings at the coal pile, and what road doesn't need those savings these days?

The ECONOMY Meter will pay for itself quickly. It's worth looking into *at once*.



"The Watchdog of Your Power"

Economy Electric Devices Co.

L. E. Gould, Pres.

Exclusive Sales Agent

Sangamo Economy Railway Meter

Old Colony Bldg., Chicago

International Combinations

HERE is the ideal fare box and register. It is not only a coin register, but also a coin and metal ticket and transfer register. The maintenance of this combination is small.

THE International Coin Register speeds up fare collecting by cutting the conductor's movements in fare collection and registration practically in half.

THE International gets more money for the railway by insuring individual, conspicuous and accurate registration.

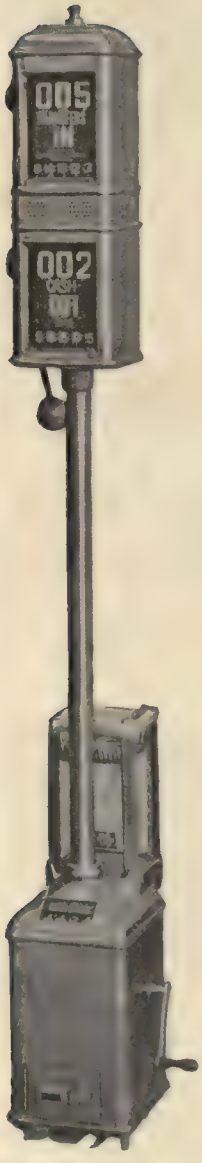
THE International eliminates entirely all rod, cord and pedal maintenance. It is one rugged unit.

ALSO manufacturers of Single and Double Registers; Coin Counting and Coin and Metal Counting Fare Boxes; Motor-Driven Station Registers, and car fittings.

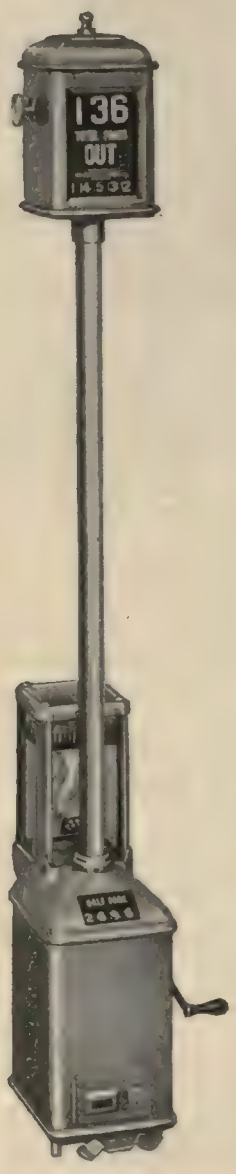
Exclusive General Sales Agents for Heeren Enamel Badges.

The International Register Company

15 S. Throop St.
Chicago, Ill.



Metal Ticket and Type C20 Coin Transfer Register



Type C14 Coin and Metal Ticket Register

FARE BOX REGISTER



They Have Come to Stay—

In every industry where man has had free reign, woman has come to take his place.

In public service work women are more prominent each day. It's up to you then to equip your cars with the latest devices to keep transportation going.

One of the best devices is the Consolidated door engine.

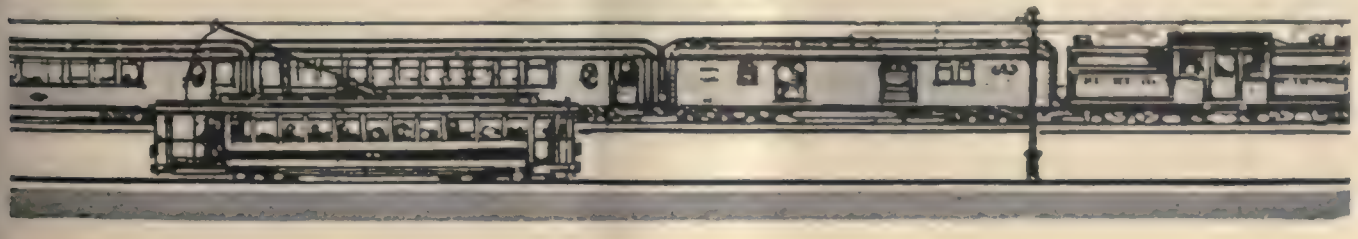
With this a woman conductor can close the door smoothly and quietly. The doors never slam and they close with a positive lock.

The Consolidated Door Engine thinks for the passengers safety. It's impossible to pinch a patron with this engine.

There is no air pressure on the piston leathers between stops because the air is always "off" when the door is not in operation. The Consolidated door engine is the highest present-day development of electric pneumatic door control.

CONSOLIDATED CAR-HEATING COMPANY

ALBANY NEW YORK CHICAGO





Do Not Waste Man Power and Money!

The Government needs men at the front, on farms and in factories.

BONHAM TRAFFIC RECORDERS perform the clerical work, reduce platform expense and save coal.

Release the man-power for war work.

Save the coal and buy thrift stamps.

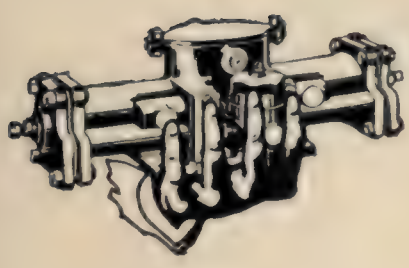
The Bonham Recorder Company

HAMILTON, OHIO

National Pneumatic Door and Step Control



On the World's Greatest Highway



Who doesn't know Broadway and its famous stepless car?

Nowhere else in the world are surface cars operated for so long a stretch on such short headways.

Nor is there another thoroughfare in the world with so many short-haul riders—and consequently with so many stops per mile.

For such supremely severe conditions the New York Railways use exclusively the National Pneumatic door and step control of this company.

NATIONAL PNEUMATIC COMPANY INC.

50 Church St. New York

515 Laflin St. Chicago

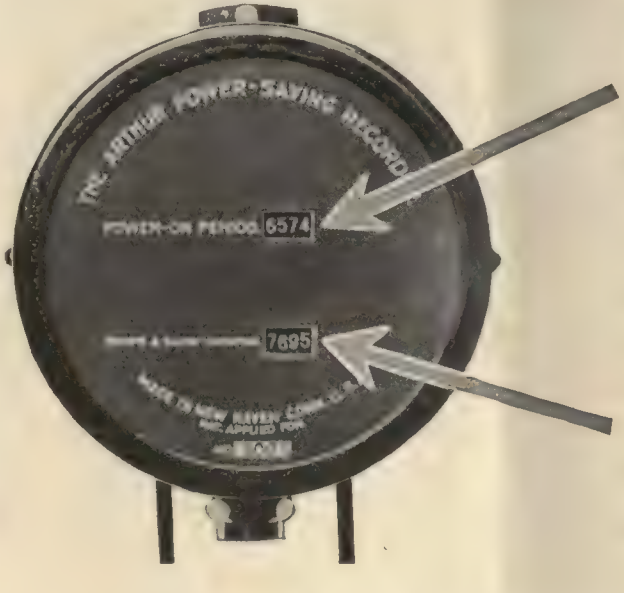
A Great Saving in Power



This recorder has shown in its service on more than 1200 cars that it can help to produce tremendous savings in consumption of energy.

The Arthur Power-Saving Recorder

is now being marketed with an additional feature which insures even greater savings.



This Added Feature

possesses the important advantage of checking the motorman's operation of

the controller

while retaining all the values which come from checking his operation of

the brakes

Requires no live wires—no fuses—no shunts—no resistances—no switches.

Do you see the enormous possibilities which this presents in educating your car crews to the best methods of safe operation and minimum consumption of power?

Write us for detailed information

The Arthur Power-Saving Recorder Co.

Second National Bank Building, New Haven, Conn.



David Gordon's patent for a steam carriage was dated 1824. He thought it necessary to imitate the action of horses' feet, so his car was propelled by mechanical legs.

This Imitation Was Not Efficient

In attempting to perfect a mechanical device that would successfully imitate the action of horses' legs, David Gordon could not equal in efficiency the original from which he patterned.

Had he been able to discover the fundamental secret of how to coordinate and reproduce the action of the horses' muscles he might have been more successful.

He was, evidently, unable to determine that fundamental principle.

The processes used in producing

Galena Oils

are just as much a mystery to those who have tried to imitate these lubricants as was the coordination of the horses' muscles to David Gordon—and for much the same reason.

It is known, for instance, that in treating Galena Oils a process is employed whereby *lead* is permanently emulsified with petroleum oils.

The fundamental principle on which this emulsifying process is based has, however, baffled those who have attempted to produce imitations of Galena Oils. Therefore, oils have yet to be produced to equal Galena lubricants in efficiency and economy.

This lead emulsion is a feature of Galena Oils exclusively. It is a feature of tremendous value in economical lubrication.

Galena-Signal Oil Co.

Franklin, Pa.

Imperial Flood Light Projectors



Type SDY



Type SCE
(1000 watts)



Type SDA

Type SDR

Protecting Bridges

Guarding Tracks, Freight Yards, Round Houses.—On 24-hours-a-day rush jobs.—Speeding up night construction work to day-time output.—

Wherever Night has to be turned into Day
Imperial Flood Light Projectors are found

They solve both the working-at-night and the protecting-at-night problems.

Their strong, steady beam is directed, spread or contracted by the simplest movements. They are made in many distinct types and take flood-lighting Mazda lamps up to 1000 watts, 105-130 volts.

Imperial projectors are of rugged build. Their casing of rust-proof material makes them thoroughly weatherproof and insures years of service. Adequate ventilation is also provided for.

Our many years' experience is at your service. Tell us your conditions and we will send along full data on Floodlight Projectors.

CROUSE-HINDS COMPANY

SYRACUSE, N. Y., U. S. A.

NEW YORK BOSTON CHICAGO



Every Incentive to Play Safe

when braking emergencies arise, exists for the motorman of a car equipped with the

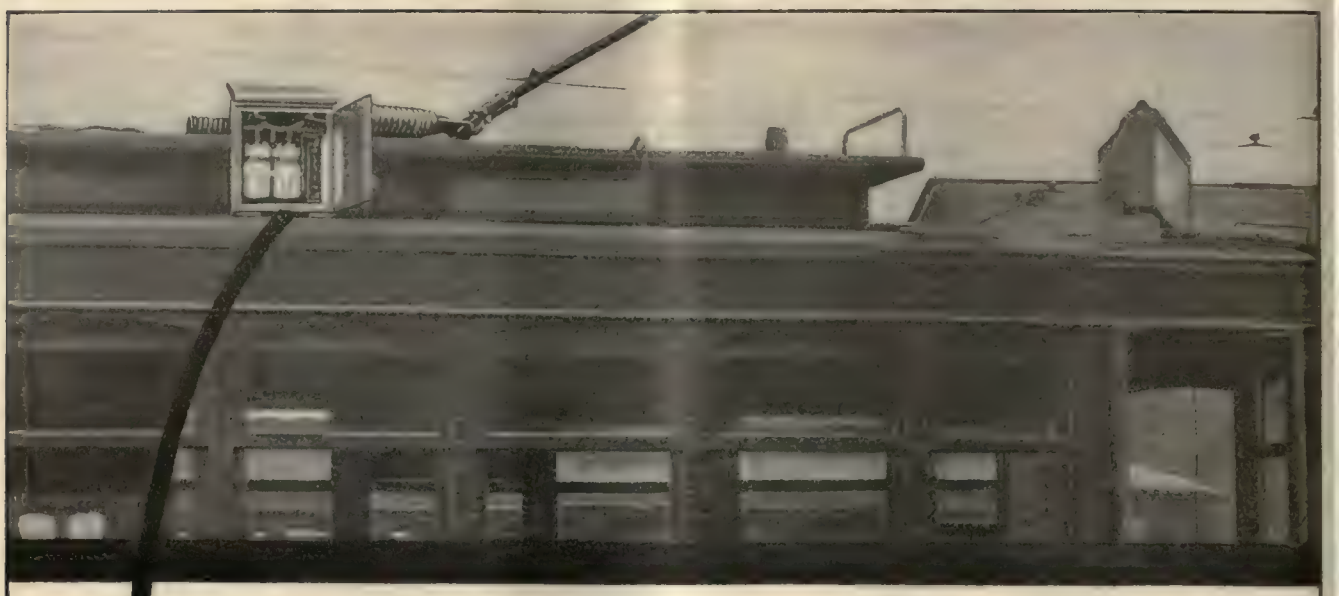
Rico Coasting Recorder



for he knows that the more efficiently he brakes his car, the more minutes he will have available out of his total running time for COASTING TIME.

Time is the Essence of Railroading

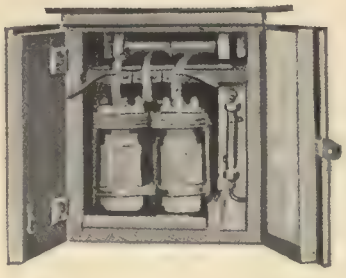
RAILWAY IMPROVEMENT CO. RICO 61 BROADWAY, NEW YORK



Do You Reckon the Cost of Lightning Damages?

One street railway executive of Pennsylvania says: "Three years ago we had, as a result of 55 electrical disturbances ranging from 15 minutes to 2½ hours duration, 35 *armatures damaged* by lightning.

"During last year after installing G-E ELECTROLYTIC ARRESTERS the total amount of damage done to our equipment through lightning was *one flash coil lost.*"



The cost of repairing armatures was not all he saved. He saved, as well, the dollars and cents represented by the irritation of a public subjected to delays in transportation.

You can render better *public service,* save money in repairs and loss of interest on dead capital by protecting your cars with G-E Aluminum Arresters.

We have the arresters in stock, but transportation is slow. Order now and have the arresters in service before the lightning storms.

General Electric Company

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*Southwest General Electric Company. For CANADA BUSINESS refer to Canadian General Electric Company, Ltd., Toronto, Ont.
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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 — New York, Saturday, June 1, 1918 — Number 22

Now If Ever Is the Time to Check Motormen's Operation

WHAT shall we say about an electric railway which in this very day and hour wastes enough power to run a $1,000,000 manufacturing plant in the same area of centralized power distribution which recently had actually to stop operations because it lacked but a fraction of the power so wasted! Why do we assert that power is being wasted? Because we don't believe that the motormen on this railway have suddenly become efficient in the use of power by reading a card and signing a pledge! How is the management to know they are efficient unless it uses an instrument that tells the facts?

For nearly twenty years we have preached to the point of apoplexy about the money that electric railways could save by using some device that would encourage the motorman to remember rather than to forget how to operate his car economically. Meanwhile, the checking instruments have been constantly improved; and the reasons for using them, such as big cars and dear coal, have become more imperative. Yet what are the facts, to-day? Hardly 10 per cent of the cars and less than 5 per cent of the operators are using car-checking devices of any kind! Are 95 per cent of American electric railways so skeptical that they must be convinced separately one by one that 10 to 30 per cent of their power is wasted at the car controller? Lack of funds cannot be considered the chief reason, because the instruments can earn their cost before they are fully paid for. This year there is the strong additional incentive for saving because of the prevailing shortage of fuel.

Responsibility for Adequate Rate Placed Clearly on Each Community

THE announcement of the War Finance Corporation that "the localities served by these various public utility enterprises should not expect the War Finance Corporation to make advances to any utility company whose statement shows that it is in actual need of increased revenue" and that the Corporation is not authorized to make direct advances to public utilities to take care of maturing issues, are important developments of the past week. The responsibility for permitting electric railways to charge adequate fares is purely up to the local authorities and that of furnishing necessary capital for utilities to the companies themselves and to the local banks, as we pointed out in an editorial entitled "What the War Finance Bill Will Do and Will Not Do," in our issue of March 30, although the Corporation announces that it is prepared to act as an instrumentality to which the banks can resort to obtain accommodation on advances made by them to the utilities upon a character of security not available for discount at a Federal Reserve Bank. The federal government does not feel it should practically make up the deficits of certain companies so that a group of citizens may continue to enjoy utility service at less than cost. After this, each community must pay for what it is getting or learn to do without.

The announcements of the War Finance Corporation should hasten companies to plan for any capital requirements, with the knowledge that the Corporation is in a position to help the banks and even to make a direct loan in those exceptional cases "where it may be made to appear to the Corporation that a meritorious borrower is being unwisely discriminated against by the banks." It should also hasten state commissions and local authorities to take action on fare increases so both the local banks and the War Finance Corporation may know what their future, as regards income, may be.

How Operators Feel About Odd Unit Fares

NO SENSIBLE and fair person will deny that electric railways are entitled to more revenue, but railway men themselves are in doubt as to the better way of getting that increase. Those who have been closer to income statements than to cars seem to feel that the direct way of charging 1 or 2 cents more for flat fare is the simplest; but those who understand the practical difficulties of fare collection and the public psychology are not so sanguine.

The financier argues that since so many 5 and 10-cent items now cost an extra cent or two, pennies for street car use will be plentiful. The operator knows how difficult it is to get the majority of riders to provide themselves with but one coin representing the exact fare. Hence troubled visions of increased car-hours for the same number of riders are ever before him. He believes that if only there were a 6-cent coin riding would remain practically unaffected. Not so with the odd fare. The latter would continually remind the short rider that he was subsidizing the suburbanite, and he would quit riding and walk after a few distressing waits in getting change from harassed conductors. More than one operator has told us that nothing would please him more than building up short-ride nickel travel and making the long-distance rider pay for what he gets. This would mean that any additional fare collection would be handled outside of the congested section.

In some cases, where the suburban franchise explicitly limits the fare to 5 cents, these men suggest the simple expedient of giving only the minimum service called for in the franchise. This action, accompanied by figures

on the cost of the service, is likely to prove a quick short-cut to a saner rate of fare. On the whole, many practical operators feel that an adjustable zone system must come eventually if the street railway industry is to be conducted like a business and not like a philanthropy.

Rush-Hour Service Is Far from Profitable

AT THE 1916 convention the committee on cost of rush-hour service presented a report in which it was stated: "The fact that rush-hour service is not necessarily profitable because a substantial proportion of the receipts are taken during that period is not generally known." Since that time there has been plenty of time for publicity, but owing to war conditions committee activity has subsided and there has been no opportunity to carry out the suggestions of the report to the effect that steps be taken to keep alive interest in this very important topic.

To show that there is need for continued educational work along these lines, one need refer only to a recent editorial in a metropolitan daily paper in which the following comment was made: "The number of street cars and elevated trains that operate through the loop during the rush hours is limited to the physical capacity of the tracks. Inasmuch as business at these hours is more profitable for the companies than at any other period of the day it is to their own interest to operate as many cars as possible."

The editorial in question showed a proper comprehension of the local street railway situation in every other particular, but on this point of the cost of rush-hour service there was evidence of a lack of appreciation of the circumstances which make the transportation problem different from that of ordinary business. The writer of the editorial probably should not be criticised for failure to grasp this point. It is doubtful if it is well understood by all railway managers, to say nothing of the average layman.

Since that committee report was presented, less than two years ago, at least one of its recommendations has gone into general effect—namely, the daylight-saving plan. Another recommendation for the purpose of lowering the peak is coming into more general use—namely, one favoring the adoption of staggered hours for factories and stores. There has also been some consideration of the high cost of rush-hour service in the rulings by commissions here and there that cheaper tickets for workingmen be eliminated.

Perhaps, therefore, we should not despair of getting a sympathetic appreciation of the strange position of electrical railways which have the smallest net return during the hours when riding is heaviest. Electric lighting and power rates are based on the principle that a rate schedule to be equitable to all consumers should make persons who need and create the peak-load service pay a price which will be commensurate with the extra cost of the service they are receiving. Surely, the time will come when the return on investment for electric railways will not be further impaired by requiring the use of more cars during the peak hours where service is already highly concentrated. Here, at least, is a good opportunity for publicity work on the part of electric railway managements.

Parked Autos Steal Streets

CAN you conceive what would happen to a railway which should dare park its cars on a downtown street all day long to avoid dead mileage between the morning and evening rush? Imagination fails us. To picture what an unkenneled press would do, we must go back to the time when we fell inadvertently out of an apple tree plump upon a dozing mastiff. Ah, yes, but this larceny of the public highway seems to be the undisputed privilege of the man who runs a car from a gasoline engine instead of an overhead wire.

It would be useless, perhaps, to talk about this abuse were it not for the fact that it injures the great mass of the public for the benefit of a comparatively few. In every city where complaints about poor street railway service are loudest there also we find that the streets were not only narrow originally but have been allowed to become mere lanes.

A municipality cannot permit the parking of automobiles from curb line to rails without forcing everything that moves to use the car tracks. When that occurs the cars that should be making 8 miles per hour can only do 4 miles per hour, and that means a reduction of carrying capacity by one-half. We can think of no more effective argument for disproving unfair allegations as to insufficient service than to tell the public that the seating capacity of the cars is not merely a question of the number and the size of cars but also of their speed. Let the argument run thus:

"The quicker we can get the cars around, the more seats we can offer you. What's the use of buying more cars when you won't let us work properly those we have? Besides, it would be impossible to get more cars through the streets during the rush hour anyway unless you keep the automobiles from choking the traffic channels.

"In the old days, hitching posts on the main streets were a sure sign of a jay town. There's no difference between a hitched wagon and a parked automobile, so far as your street railway service is concerned. You wouldn't want street cars to be parked all day, so why allow the automobile owner to use public property for a rent-free private garage?"

Boston Public Control Act Is Fundamental in Scope

THE act passed last week by the Massachusetts Legislature, placing the Boston Elevated Railway under the control of public trustees, marks a notable advance in utility regulation. The main features of the act have not been changed since the proposed bill was commented upon in the issue of April 27, but their importance warrants another mention of them. One important feature is the provision that the cost of service shall be at all times covered by the rates. An unlimited sliding scale is provided, and should the traffic under any particular fare or transfer arrangement be too small to yield the guaranteed return of 6 per cent (as well as the lower intermediate returns of the next four years), the deficit in the reserve fund is to be made up temporarily from the tax levies of the municipalities in which the company operates. In the last analysis, this means that the public will obtain and pay for precisely the volume and the character of service which it

wants, and it would be hard to suggest a fairer arrangement to investor, car-rider and community.

Another important provision is the transfer of supervision from the Public Service Commission to the five public trustees, appointed by the Governor. This means that in place of the former method of regulation without responsibility for management comes a new authority directly responsible for management. The ten-year terms of the trustees augur well for the protection of the property against political exploitation. If men of high caliber are appointed, as seems likely, efficient operation should be continued.

Not the least of the good features of the act is the fact that it places the company's securities upon an investment plane in Massachusetts only less stable than that now occupied by government bonds; that through it new capital needed to meet the increasing demands of the community for transportation can be obtained, and that service, so essential under war conditions, can and will be improved. We agree with President Brush, whose views regarding the law are printed elsewhere, that the act may well be regarded as epochal in its expression of the basic relation between service and cost. Its administration will be watched with interest.

Provide Now Against a Fuel Scarcity Next Winter

AS "LONG DISTANCE" weather prophets are notoriously unreliable there seems to be no possibility of an accurate forecast of the severity of the coming winter. But while we may not be able to estimate accurately the demands which the weather man will impose on Uncle Sam's coal pile or foresee all of the impediments he will put in the way of our transportation facilities, it certainly does not require a prophet to predict from the evidence now in hand that coal will be a scarce article next winter. We are being urged by the Fuel Administration, the coal people and many patriotic agencies to "make hay while the sun shines" and provide now as fully as possible against our next winter fuel needs. It seems that too much emphasis cannot be placed on the subject of fuel preparedness and on the necessity of keeping our mines working at top speed throughout the summer.

To the large fuel user, however, fuel storage brings with it problems all its own. For example, there is a wastage in fuel and a labor charge involved in the handling and storage of fuel. Again, many utility companies do not have storage space available. Moreover, some of our coals are difficult to store because of the danger from spontaneous combustion. This last is particularly true of the Middle Western coals. As result of past sad experience many large users of fuel now wholly dependent on these coals hesitate over the storage proposition. The submerged method solves the fire hazard problem, but the pits required are expensive and take time and labor for their construction. They are, therefore, out of the question at this time. Fortunately other storage methods are available. The United States Bureau of Mines and several of our state university experiment stations have made extended studies along the general lines of coal storage and coal handling. The results of the work of these public research facilities are available to those interested and should prove of great value in connection with the present coal problem.

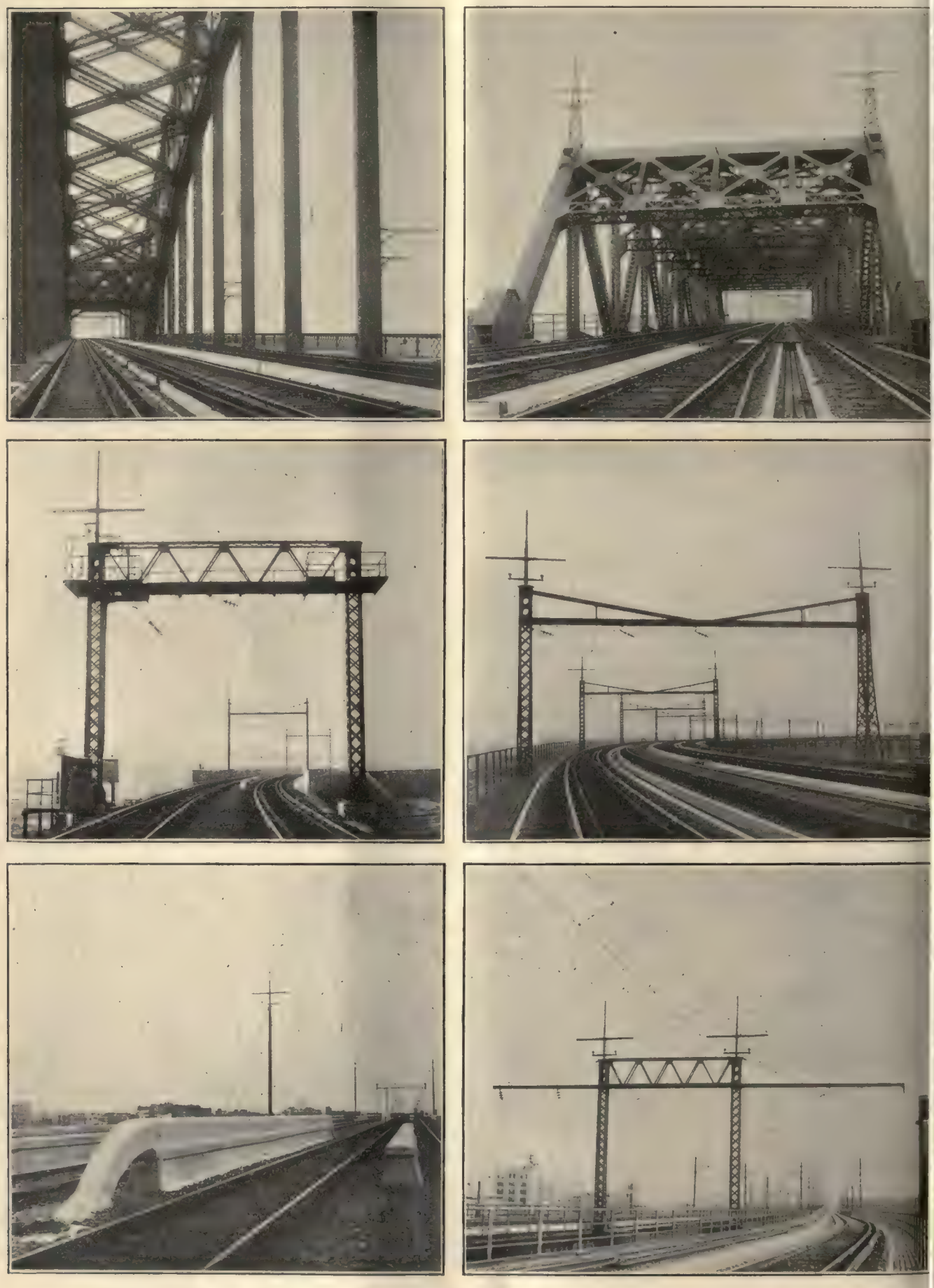
Nearly every railway utility has power conditions and fuel problems which in a way are peculiar to it alone. In some cases the effects of a fuel shortage may be alleviated by a permanent or breakdown connection with another power system which is more fortunately located with regard to the source of fuel supply or which is fed from a hydroelectric plant. In others some possibilities exist in the way of using a different fuel temporarily. But whatever the possibilities are they should be studied and plans should be laid to utilize them to their fullest extent should the emergency arise. Obviously the time to do the studying and planning is now.

War Finance Corporation Urges Public Utility Commissions and Municipal Authorities to Give Prompt Consideration to Applications From Utilities to Increase Their Rates

THE *directors of the War Finance Corporation on May 24 authorized the following statement:*

"The directors of the War Finance Corporation have under consideration applications from many public service corporations doing business in various sections of the country, for loans aggregating a large amount.

"The directors of the War Finance Corporation do not feel that they have any authority under the law to make loans except upon adequate security as required by the act, and they are convinced that the inability of a utility company to earn a sum at least sufficient to pay its fixed charges, taxes, maintenance and repairs, is conclusive evidence of the inadequacy of its own obligation as security. The directors of the corporation feel that the localities served by these various public utility enterprises should not expect the War Finance Corporation to make advances to any utility company whose statement shows that it is in actual need of increased revenue. It is a matter for the local authorities to determine whether or not an increase in rates sufficient to maintain the enterprise as a going concern should be granted. It is urged, therefore, that the proper authorities give prompt consideration to applications made by public utilities for permission to increase rates, in order that the directors of the War Finance Corporation may know when applications for loans are presented by public utility corporations whether or not they will be able to give adequate security."



Typical Views of Overhead Construction, New York Connecting Railroad



PORTAL AT SOUTHERN END OF LITTLE HELL GATE BRIDGE SHOWING CROSS BEAM AND SAFETY ANCHOR FOR TROLLEYS

11,000-Volt Overhead on the New York Connecting Railroad

Construction Is Complete and Tested Out—Everything Ready for Electric Operation When New Locomotives Arrive—Some Details of the Telephone and Telegraph Conduit Construction Are Included

THE New York Connecting Railroad is a connecting link between the New Haven and Pennsylvania Railroad systems at New York City. While of not great length, this road is of unusual interest for several reasons. In the first place, it has made all-rail communication possible via New York between Boston and Philadelphia and points south. Formerly through trains between these points had to be ferried around Manhattan Island. A few passenger trains were interchanged between the two systems over a car ferry route of about 11 miles from Jersey City to the Harlem River. The freight interchange was by a still longer ferry, about 13 miles long, between Greenville and Oak Point. These float services were conducted by the New Haven Railroad, which will operate the New York Connecting Railroad.

The new electrification will make it possible to haul trains behind one electric locomotive, of the a.c.-d.c. type used for passenger service on the New Haven road, from New Haven to the Pennsylvania Station in New York City. Most of the distance will be under the 11,000-volt overhead of the New Haven Railroad, the remainder on the 600-volt third-rail line of the Pennsylvania Railroad. The freight tracks of the New York Connecting Railroad are not electrified except for pusher service up the bridge grades, and the freight service is conducted over the Long Island Railroad, under steam operation, to Bay Ridge, thus eliminating a large part of the freight-car ferrying formerly involved in interchange between the two roads. A short ferry trip is necessary from Bay Ridge across New York Bay and will continue to be so.

The New York Connecting Railroad is interesting further because for its length it is an unusually expensive line. The total cost of the road itself was about $30,000,000, and an additional expenditure of $10,000,000 will be involved in the completed project including necessary improvements to the Long Island Railroad. Expensive fills and viaducts, including the famous Hell Gate bridges, have largely contributed to make the construction so costly.

At the meeting of the New York Railroad Club held on March 15, 1918, E. R. Hill of Gibbs & Hill, the designers and builders of the overhead and telephone and telegraph conduit system of this line, read a paper which contained much valuable information regarding the New York Connecting Railroad. This paper was abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for March 23, 1918, page 556. He stated that the length of two-track passenger line, from Port Morris to Sunnyside Yard, which is now completely electrified, is 5 miles. The two-track freight line, from Port Morris to Bay Ridge, which is to be electrified later, is 20 miles long. The famous Hell Gate bridge has a length between abutments of 977 ft., and a length outside the towers of 1150 ft. Its clear height above mean



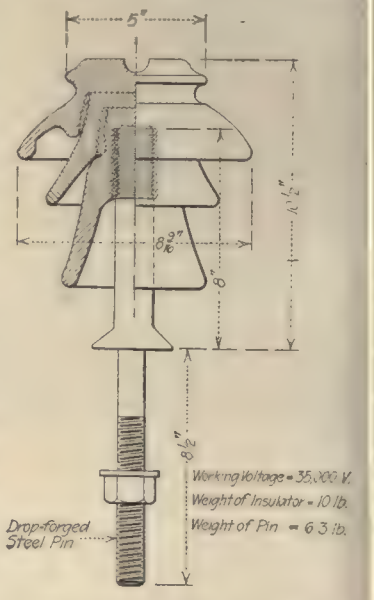
CROSS CATENARY OR WIRE CROSS-SPAN CONSTRUCTION, WITH GUYED TUBULAR POLES (FUTURE SIGNAL BRIDGE IN BACKGROUND)

high water is 135 ft. Mr. Hill explained that the gradients involved in surmounting the Hell Gate bridge, and descending under the East and North Rivers imposed much heavier requirements upon the locomotives than are imposed by the comparatively level New Haven line. It has been necessary to provide locomotives having a one-hour rating of 2550-hp., 50 per cent greater than the capacity of the present heavy New Haven locomotives.

To supply power to these locomotives very substantial overhead construction has been erected. The nature of the line, with its numerous curves and viaducts, has made it necessary to design a number of special structures for the support of the overhead. Provision for expansion occurring in the viaduct trusses and girders, has also required careful consideration in the design. The way in which many of the problems were solved is indicated in the accompanying illustrations.

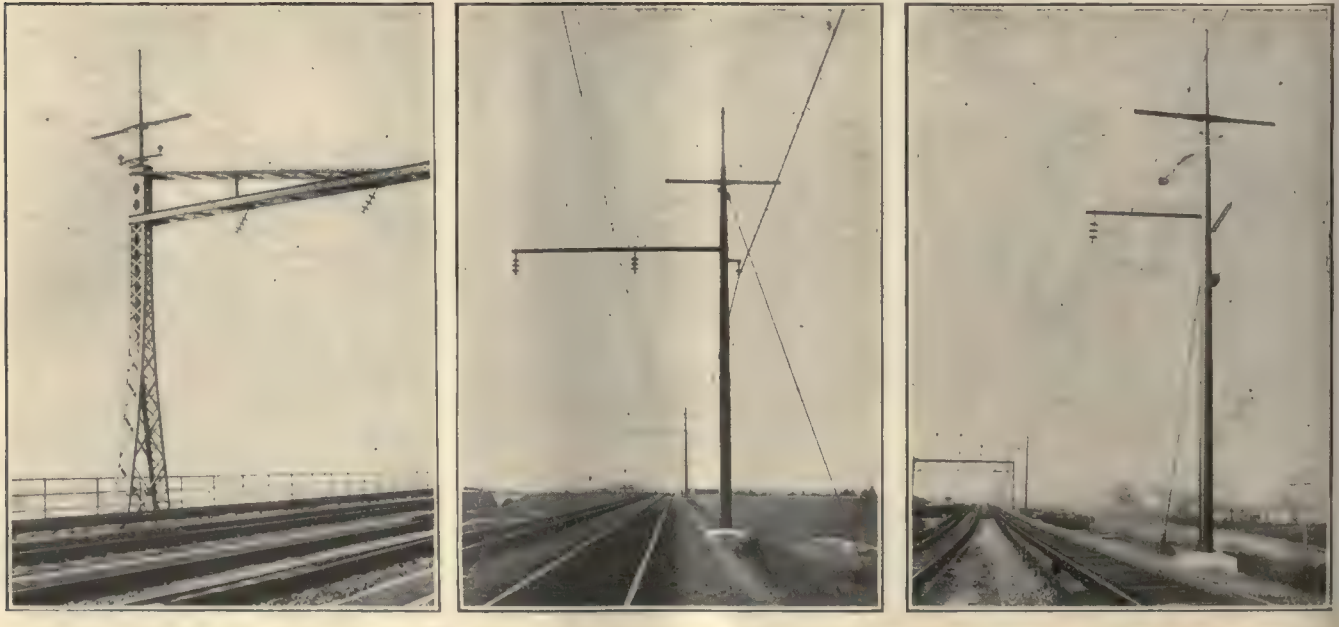
While in general the standard overhead construction of the New Haven road was followed, in details there are a number of differences. Readers of this article will also notice a number of points of similarity between the overhead construction on the New York Connecting Railroad and that on the Chestnut Hill branch of the Pennsylvania Railroad described in the issue of the ELECTRIC RAILWAY JOURNAL for April 27, page 799.

Wherever on the line there is opportunity for guying, pole construction, either with cross span, or brackets, similar in design to those used on the Pennsylvania Railroad electrification at Philadelphia, is employed. The poles are set 6 ft. deep in concrete foundations about 3½ ft. square and extending a foot more or less below the bottom of the pole. The pole height from the rail surface to the point of attachment of the guys is about 35½ ft. The guys are 1½-in. rods attached to the pole by means of collars, provided with turnbuckles for adjustment, anchored firmly in reinforced concrete blocks set not less than 8 ft. below the ground surface, and protected from the anchor to a point above the ground by means of 3-in. boiler tube.



INSULATOR USED AT PRESENT ONLY FOR SIGNAL CIRCUITS

The pole top is occupied by the following attachments: Just above the guy rod collar or clamp is a short crossarm made of two angle irons placed back to back, which carries the 2200-volt signal feeders on pin-type insulators. Above this is a longer crossarm, not yet occupied, which is designed to carry four high-voltage wires to



At Left, View of Latticed Post Used on Viaducts. In the Middle, Pole with Bracket for Two Tracks. At Right, Single-Bracket Catenary Support with Extra Heavy Pole on Which a Crossover Trolley and Messenger Are Dead-Ended.

TYPICAL OVERHEAD CONSTRUCTION ON NEW YORK CONNECTING RAILROAD



SIGNAL RELAY BOX ON PIER BENEATH VIADUCT TROLLEY BRIDGE SUPPORTED ON CURVED BRACKETS

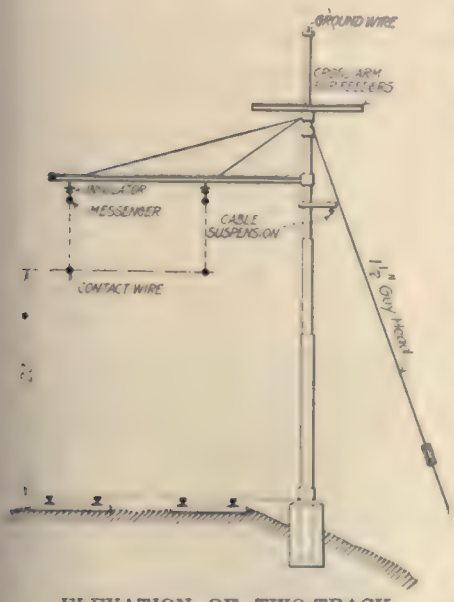


COVER OF IRON SPLICING CHAMBER FOR CONDUITS ON VIADUCT

be used as trolley feeders. Projecting from the top of the pole is a rod which carries at its upper end, a distance of 8 ft. above the upper crossarm, a ½-in. galvanized Siemens-Martin ground wire.

The signal wires, which are No. 00, carry power for the signal system. They are mounted on insulators of a type which is the New Haven standard for 11,000 volts although the initial voltage is much lower. In case of failure on one side of the line the current will be automatically thrown to the circuit on the other side.

The pole top described is standard along the line even on the four-track structural bridges which are fitted on each side with tubular bonnet poles cemented into the structural posts. The same crossarms, etc., are provided as on the other poles. On the passenger connection between Sunnyside Junction and Sunnyside Yard the signals are fed by a single 2200-volt rubber insulated cable, which is carried on a ½-in. Siemens-Martin steel cable outside the one and two-track bracket structures. A switch at Sunnyside Junction automatically throws this cable onto the power circuit that is energized. In the standard bracket construction the angles are formed of angle or channel irons placed back to back. The single-track brackets are attached to the poles by a simple band, the weight being supported by one sag rod. In the longer brackets two sag rods are employed.



ELEVATION OF TWO-TRACK BRACKET SUSPENSION

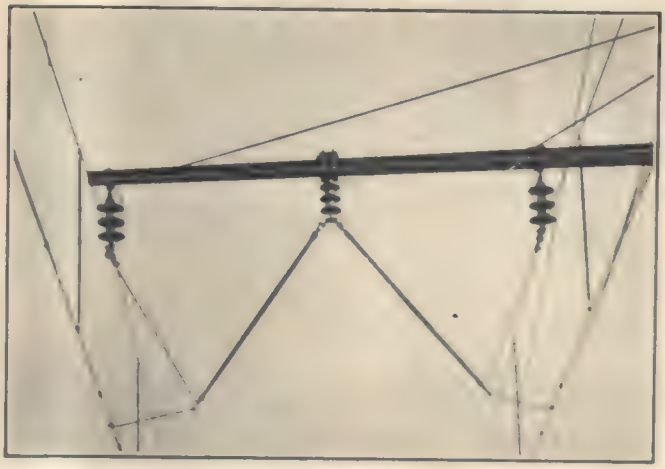
Where guying is not possible, channel-iron cross structures with sag braces, or in some cases latticed bridges, are used. In some places these are supported from steel poles, but in general latticed poles well spread along the line of the track are employed. Where the feet of these latticed poles span expansion joints they are rigidly supported on but one side, the other foot resting upon a plate upon which it can slide, bolts in slotted holes being used to prevent overturning.

As these latticed poles are necessarily supported outside of the bridge girders their weight is carried on two substantial steel brackets each, riveted securely to the outside girders of the viaduct. A photograph has been reproduced to show this construction.

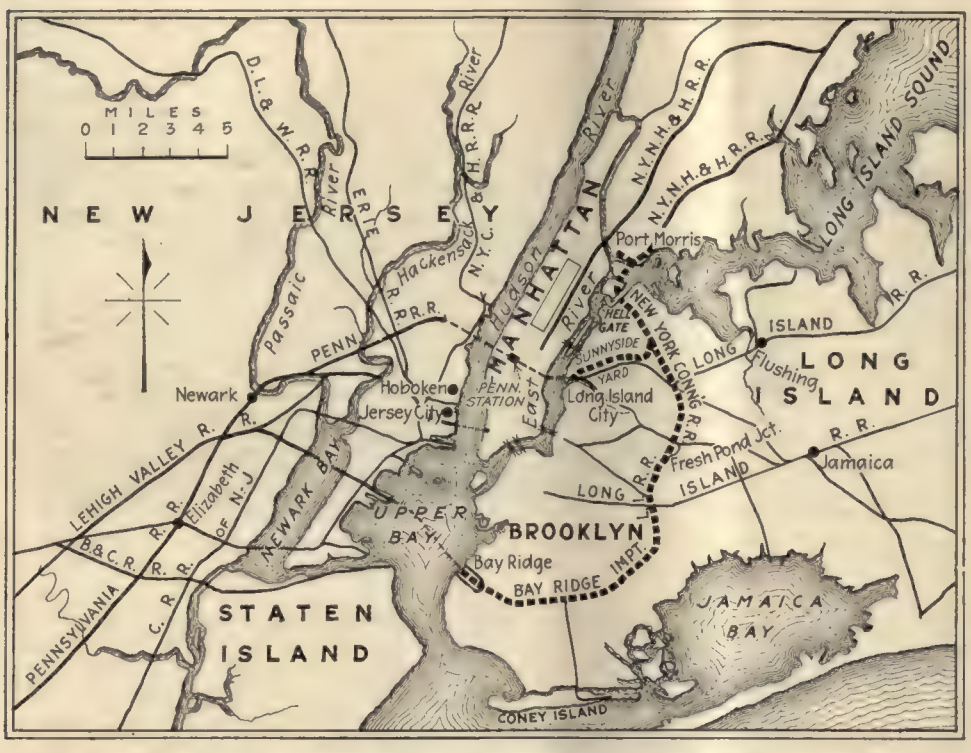
Within Hell Gate bridge the contact wires are supported by cross-wires attached to the steel members of the bridge. This makes a light, inconspicuous system not detracting from the appearance of the bridge. At either end of the Little Hell Gate bridge, towers are used to support a cross-beam for carrying the contact wires. One of these is also used as a safety anchor for these wires. On Bronx Kill bridge the contact wire insulators are attached directly to overhead steel members with safety anchors at each end.

Catenary Construction Follows New Haven Standards

The main messenger is of $\frac{9}{16}$-in. strand similar to that used on the Chestnut Hill electrification. From this the No. 00 copper grooved secondary messenger is sus-



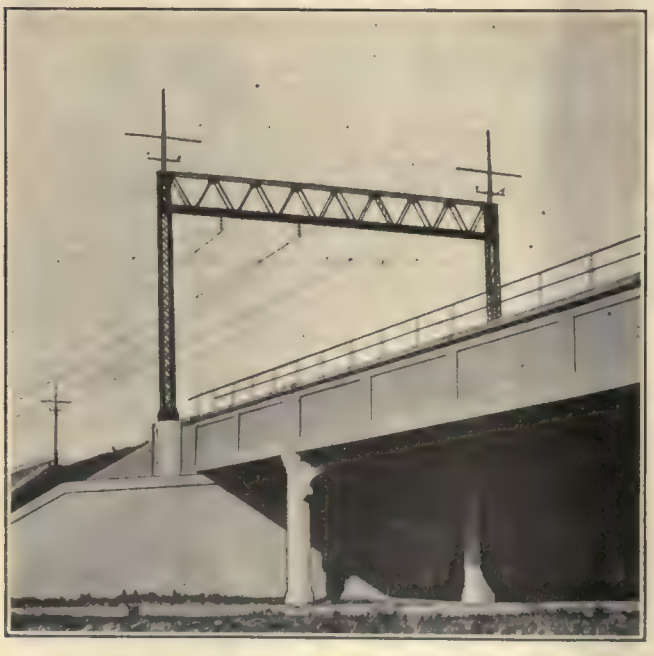
SAMPLE OF SPECIAL BRACKET CONSTRUCTION



MAP SHOWING NEW YORK CONNECTING RAILROAD AND CONNECTIONS

pended by ½-in. round hanger rods of steel, hot galvanized. On the upper end of the rod is a screw-clamp hook, and the lower end of the rod screws into a clamped casting on tangent construction, or is bolted through the clamp on curved construction.

A No. 000 grooved copper alloy contact wire is supported 1¾ in. below the secondary messenger, by means of clamps placed between, but not at the hangers, except on curves where the two wires are clamped together at every hanger. The spacing of the hangers on tangents is approximately 30 ft., with two bolted clamps between adjacent hangers. On curves the hangers are placed about 15 ft. apart.



CATENARY SIGNAL BRIDGE AT SEVENTEENTH STREET AND WILSON AVENUE, ASTORIA

The main messenger wire is insulated from the structures by three 10-in. free-swinging porcelain disks, similar to those used in the yards of the New Haven Railroad. This arrangement was adopted to secure the advantages of economy, insulation and ample strength and, most important of all, to provide insurance against interruptions of service due to the failure of any one insulator unit.

In anchoring and sectionalizing the catenary system three 6-ft. wood-strain insulators were used in multiple with an equalizing yoke. To prevent side swaying of the contact and secondary messenger wires on tangent track in very heavy winds, a steady brace or "steady," was installed. These steadies are insulated from the structures by strings of three porcelain insulators similar to those used to support the contact wire. The contact wires themselves are insulated from each other by single 6-ft. wood-strain insulators.

No steadies or pull-offs are used on curves, the system floating naturally into an inclined position.

EXPANSION JOINTS A FEATURE OF THE CONDUIT SYSTEM

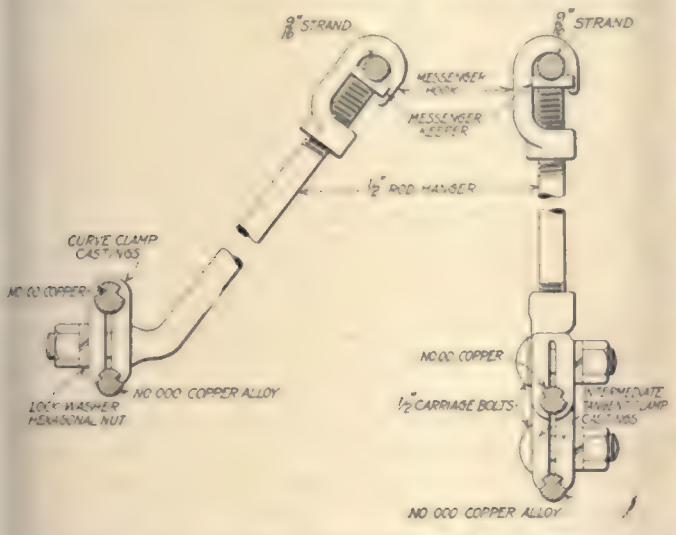
For the purpose of railroad communication a telegraph and telephone conduit line was built connecting with the Pennsylvania Railroad at Sunnyside Yard and the New Haven Railroad at East 132d Street between Harlem River and Port Morris, with connections into the railroad towers and to frequent telephones on the railroad. On the viaduct the conduit line consists of six fiber ducts protected by heavily reinforced concrete and provided with steel splicing chambers. In the fill south of the viaduct a six-way underground conduit line was constructed of vitrified clay ducts incased in concrete. The standard manhole is of pre-cast, oval, reinforced concrete type. Rectangular concrete manholes cast in place were installed at special locations and in the short twelve-duct section west of Woodside Avenue.



CONCRETE TEST HOUSE FOR TELEPHONE CABLES AT WOODSIDE AVENUE

In general the conduit line is located between the tracks. On account of the many expansion joints made necessary by the presence of the numerous viaduct girders, this conduit construction is quite unusual. At these expansion joints the conduit is ended off square with several inches of space between adjacent ends. The gap is covered over with sheet iron bent to clamp the conduits tightly.

On the viaduct the telephone cable was simply offset to allow for expansion and contraction of the steel girder, which amounts to about ¾ in. On Hell Gate and Little Hell Gate bridges, however, the maximum ex-



CLAMP HOOKED HANGERS FOR USE ON CURVES AND TANGENTS

pansion in the bridge system will be about 10 in. and here the cable was terminated with potheads and flexible rubber-insulated cable used for connection between the potheads.

A forty-five-pair cable was installed along the passenger section. This is lead covered and consists of twelve pairs of No. 13-gage copper wire quaded, thirty-two pairs of No. 16-gage copper wire quaded, and one lead-incased test pair. The test house at East 132d Street is connected with the Harlem River Station by an aerial cable. South of Sunnyside Junction a cable has been run along the freight line to Bay Ridge, most of the way being carried overhead. The poles used are Southern pine impregnated by creosote by the vacuum process. This cable line connects with the Long Island Railroad system at its East River Long Island substation, a new twenty-four-pair cable connecting with Jamaica.

Among the manufacturers of material used on the New York Connecting Railroad electrification were the following:

Structural bridges	Virginia Bridge & Iron Company
Tubular Poles	National Tube Company
Steel messenger and ground wire	American Steel & Wire Company
Copper auxiliary messengers	John A. Roebling's Sons Company
Copper alloy contact wire	Bridgeport Brass Company and Standard Underground Cable Company
Copper signal transmission wire	John A. Roebling's Sons Company
Bonds	American Steel & Wire Company
Insulators	Ohio Brass Company
Guy rods	American Iron & Steel Manufacturing Company
Catenary hangers and castings	Westinghouse Electric & Manufacturing Company
Signal power cable	Okonite Company
Vitrified clay ducts	Shawmut Manufacturing Company
Communication cable and equipment	Western Electric Company

Rates to Cover Bonuses

French Tramways Have Been Authorized Generally to Increase Rates for Sake of Allowances to Employees

ACCORDING to agreements published in the *Journal Officiel de la République Française* from October to February, 1918, French tramways have generally granted supplementary pay to employees. The journal mentioned has published in full the decrees issued by the Minister of Public Works and Transports, which have authorized the managements of tramways and interurban railways to increase the tariff for transportation of passengers or merchandise and accessory charges for handling and storage.

These increased rates have been allowed in most, if not all, cases, according to the publication quoted, because of increased wages or bonuses being paid owing to the prevailing high cost of living.

In requesting an authorization for increase in rates the following method of procedure is general. The concessionaire submits to the prefect of the municipality a statement showing the necessity and also the amount of supplementary allowances to be paid. This statement is accompanied with a request for authority to increase transportation charges. After an agreement has been reached and signed by the railroad management and the prefect, the proposition is submitted to the President of the Republic, who, if he approves, signs the proposal. The Minister of Public Works then issues a decree making the agreement effective and ordering it to be entered in the *Bulletin of Laws*.

The decree may be retroactive in so far as it relates to supplementary wage. In some cases these are made payable from a date several months before the proposal was even submitted to the prefect for consideration. As an example of this the agreement between the prefect of the Somme and the director of the Economic Society of Railways was signed on Sept. 15, 1917, and approved by the President on Oct. 30, 1917, but the war bonuses dated from Nov. 1, 1916.

The decrees in general cover the period of the war and one year subsequent to cessation of hostilities. It is stipulated in many agreements that a separate account must be kept both of additional receipts and of expenses resulting from these increases, and that such receipts are exempt from any concession tax only in so far as the receipts exceed the expense. In some cases it is specified that excess net receipts shall be used in road betterment. In other cases the agreement states that deficits under the new rates may be charged to that portion of the receipts due to the municipality as a concession tax.

The Urbana & Champaign Railway, Gas & Electric Company, included in the Illinois Traction System, estimates that only 0.42 per cent of an average man's income is spent for electric railway service, 1.08 per cent for gas, 1.03 for electric light and power service, 45 per cent for food, 16 per cent for rent and taxes, 14 per cent for amusement and charity, 12 per cent for clothing and 10.47 per cent for miscellaneous expenditures.

Helping to Win the War

Electric Railway Lines in Newport News, Va., Wilmington, N. C., and Charlotte, N. C., Are Doing Their Share Toward the Speeding Up of War Work at Cantonment, Training Ground and Shipyard

TO MEET the requirements of the United States in these momentous times, electric railways are utilizing as many resources as their restricted financial condition permits. The service rendered differs—it may be for the transportation of soldiers to and from camp; it may be for the hauling of freight; it may be for the carrying of shipyard or munitions workers. Whatever the service is, however, it is done with a patriotic willingness that makes the describing of it a double pleasure.

This journal has previously published items in regard to the war service of electric railways, but this week it is presenting a more extended description of the work being done in some of the Atlantic Coast cities, namely, Newport News, Va.; Wilmington, N. C., and Charlotte, N. C. Similar articles in regard to other cities in this country will appear in subsequent issues.

Accelerating Aviation and Shipbuilding at Newport News

One Line Built to Langley Field—Shipping Board Is Financing Another to Shipyards—New Power and Car Equipment

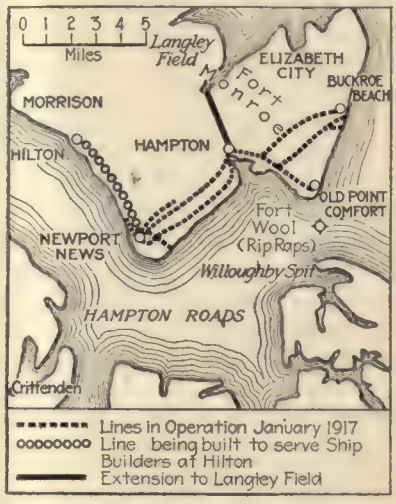
IN 1914, from the very beginning of the world war, Newport News, Va., became one of the most important points for shipments to the Allies, particularly of coal, horses, grain and meat. As the war began in August of 1914, the increase in exports during the following months of that year was not enough to show an imposing total; but the record for the following year is astounding. Thus, in 1914, the value of the exports totaled $8,929,214; and in 1915, $96,800,691 or nearly eleven times as much! It may be of some interest to add that during 1915 the exports included 170,000 horses and mules, 64,000,000 bushels of grain and 1,487,000 tons of coal.

It can readily be imagined that such increases as this have had a most stimulating effect on the local utility—the Newport News & Hampton Railway, Gas & Electric Company. Yet all this activity with the export business has become the smaller part of the enormous expansion on the famous lower peninsula of Virginia. To-day it is the work of the United States itself that is commanding the resources of the company.

Between Jan. 1 and July 1, 1917, 235 dwellings had been put up in Newport News and vicinity because of the activities there, and some 300 more were under way. With the entry of the United States in the war, the total has gone to more than 1000. A part of the building program includes the erection of a model town named Hilton, with schools, churches and other public edifices complete. Furthermore, the Newport News Shipbuilding & Dry Dock Company secured immediate expansion of rooming facilities by leasing Buckroe Beach Hotel from the utility to house 300 men.

At the Newport News shipyard alone there are now 9000 workers with an expected early total of 18,000. Since July, 1917, also, the daily shipyard travel has risen from 3200 to about 5000—an increase of 75 per cent. These men work in two eight-hour shifts.

A second shipbuilding activity there is that of the Newcomb Life Boat Company, which has contracts for $3,000,000 of submarine chasers and wooden ships. It is already employing 350 men and expects to need 3000. The great aviation field and proving ground at Langley Field and the 15,000-acre Field Artillery Drill Grounds now under way represent a considerable increase to the previous war-making facilities at this old-time center of naval and artillery activities. On the whole, then, travel is growing at an enormous rate, for the population has doubled (60,000 to 120,000) since the United States became a belligerent. For example, the riding in March, 1918, showed an increase of 84.88 per cent over that of March, 1917.



RAILWAY LINES OF NEWPORT NEWS & HAMPTON RAILWAY, GAS & ELECTRIC COMPANY

One Extension for Aviation Service, Another for Emergency Fleet Corporation

To meet the requirements of the government, the company in April, 1917, began the construction of a 3.1 mile line to Langley Field through an associated company called the Hampton & Langley Field Railway. This line was completed in August, 1917. The passenger business is not of primary importance here, the real service of the line being the hauling of freight from an interchange track connection with the Chesapeake & Ohio Railway at Hampton. Twenty carloads of freight are being hauled each way daily with an electric locomotive. The all-day headway for passenger service is only forty minutes, but double-headers of five cars each are run twice a day for the workers at the field.

Through the prompt action of A. Merritt Taylor, manager Passenger Transportation Service Section of the Emergency Fleet Corporation, funds have been advanced to the company for a 3-mile single-track line from the Newport News city line to the new community of Hilton, previously named. In connection with this

extension the company will use eighteen cars now on order and give, probably, a fifteen-minute service throughout the day.

Other work of the way department includes a ¼-mile extension into Camp Stuart from the Twenty-third Street line, Newport News, twenty-car storage track loops at Newport News for the shipbuilding service and a loop on Twenty-third Street at the Chesapeake & Ohio Railway connection.

Eighteen New Cars, Ten Leased Cars and Much Rebuilding

As of April 1, 1918, the company had forty-nine motor cars and thirty-four trailers on hand. To these it has added six cars leased from the New York & North Shore Traction Company and from the Norfolk Southern Company, and it has eighteen Brill semi-convertible cars on order. Between 1914 and 1918, it had bought four center-entrance cars, rebuilt another four cars to center-entrance type, rebuilt a number of open cars to all-year type, bought six Brill semi-convertible cars, purchased nine cars from Cleveland, three of which had motors and six of which were equipped with motors by stripping open cars which are now run as trailers, etc. Without going into more details, it is plain that the company had to show war-time ingenuity to get the most equipment for the least new investment.

To keep the enlarged car park in shape, 100 per cent increase of capacity is being secured by adding to one side of the present shop a 41-ft. x 160-ft. section for blacksmith and general inspection and to the other side a 35-ft. x 116 ft. section for painting and carpentry. The present paint shop becomes the new storeroom. The only new tools installed are a bolt threader and a South Bend lathe.

New Power Equipment and 6½-Mile Transmission Line

The most important work in the power department is the erection of a 6½-mile, 10,000-volt aluminum transmission line from Hampton to the shipyard at Newport News. For these and other needs, three 1000-kva. 3450/10,000-volt transformers were ordered for the power house.

At the Hampton plant, also, the company has just added three 550-hp. B. & W. boilers. In 1917, it installed there a 4500-kw. Curtis turbine, raising the total output to 10,300 kw.

A 500-kw. general electric rotary has also been required for the Newport News substation.

Freight and Ice Facilities—Housing for Platform Men

The great congestion of both car and vehicular traffic at Newport News has made it necessary to abandon the store-door delivery heretofore made by the freight department. In consequence, it was necessary to erect a brick terminal at Newport News. The main building is 30 ft. x 85 ft., the office 15 ft. x 16 ft. and the wooden addition, 30 ft. x 50 ft. This business is chiefly the transfer of small lots from the Baltimore steamers at Old Point Comfort to customers at Newport News.

This company is one of the few public utilities doing an ice business. It has increased its storage capacity to 4900 tons.

Not the least of the company's troubles is to hold its men, because of both the wages and the housing conditions. The former have been practically doubled since war days, while the latter have been alleviated by building a forty-men dormitory at Hampton.

In Dollars and Cents

The effect of the war at Newport News on the finances of the company may be summarized as follows: Gross earnings in 1913, $794,176; in 1914, $813,861; in 1915, $916,172; in 1916, $1,013,711; in 1917, $1,357,308. No depreciation fund was set aside until 1915, when the amount was $25,080; in 1916, $71,209 and in 1917, $106,619. Despite this the net has increased as follows: In 1913, $59,393; in 1914, $73,212; in 1915, $104,884; in 1916, $117,224; in 1917, $180,665. It is difficult to say what 1918 will show owing to the great increase in cost of labor and material. It may be added that of the $1,357,308 gross in 1917, $541,228 came from the railway; and that the railway ratio of operating to gross was 55.5 per cent.

Of course, it is not to be expected that the company's business will be so large after the war; but much of the present activity will be permanent because of the manifest advantages for manufacturing of the Newport News-Hampton Roads country and the permanent ship and government work. The company very sensibly is using what it has to the limit instead of making investments that would prove hard to carry after the war.

Carrying Soldiers to Carolina Camp

Two Double-Track Extensions 1¼ Miles Each With Extra Cars Cost $200,000 for $500 Daily Maximum Gross with 5-Cent Fare

ONE of the great troop encampments of the South is Camp Greene, which is located about 3 miles west of Independence Square, the center of Charlotte, N. C. To serve this encampment properly, the Southern Public Utilities Company has constructed two double-track loop-terminal lines each 1¼ miles long. One of these is a spur from the main line of the associated Piedmont Northern interurban; the other, an offshoot of the Lakewood Park line. The more distant terminus is 4 miles from Independence Square.

The morning headway on the long line is twenty minutes and on the short line, fifteen minutes; the afternoon and evening headways on both are five minutes. Trips to town are popular with the troops, for this is one of the few camps from which a city can be reached for 5 cents. At the same time travel varies greatly as the number of soldiers ranges from 10,000 to 50,000.

The riding is not in proportion to these figures, however, for furloughs appear to grow scarcer when the camp is crowded. In general, Saturdays and Sundays are the heavy days. Early in May, the week-end travel, which included some civilians, was about $500 a day, or 10,000 fares.

To supply quickly and at least cost the need for rolling stock, the company has supplemented its regular double-truck vestibuled cars by eight elevated railway cars. These former trailers were fitted with two 65 hp. motors and are run single-ended. They seat sixty and

can carry 150 passengers. Their total cost was $3,500 each.

The company also bought two double-truck cars from Vicksburg, Miss., and inclosed four of its open cars to which it added air brakes.

These developments for a transient but patriotic



SOUTHERN PUBLIC UTILITIES CAR TRANSPORTING TROOPS AND CIVILIANS

purpose have cost the company about $200,000. If funds were available, the company could use a 1000-kw. rotary converter to advantage as the present equipment of two 500-kw. and two 750-kw. machines allows no reserves for contingencies.

Wilmington Helps Shipbuilding

In North Carolina City Shipyards Will Be Served by Extensions—Multiple Unit Cars and Prepayment Areas Considered

LIKE its northern namesake in Delaware, Wilmington, N. C., is an excellent site for shipbuilding. It is now the home of two large projects in that field, one concrete and one steel. The concrete plant, which is already at work, bears the name Liberty Shipbuilding Company. It is located in the southern part of Wilmington with some 300 men at work now and 1000 in the near future.

At a distance of about 1 mile further south along the Cape Fear River is the plant of the Carolina Shipbuilding Corporation, a subsidiary of the Fuller Construction Company, the well-known New York contractor. This company has a contract for twelve 9600-ton steel ships. When building gets under way it will employ 3000 men.

Negotiations for 3¼ Miles of New Track

The Tidewater Power Company, by building 3¼ miles of new single track, would be able to give a double-track service although the old and new tracks would not be adjacent to each other. At this writing negotiations are on with the Emergency Fleet Corporation concerning the financing of this work.

So far as rolling stock is concerned the company is fortunate in being able to use for this twice-a-day service the eighteen large double-truck cars that have hitherto been used chiefly for Saturday afternoon and holiday travel to Wrightsville Beach. These cars have Westinghouse HL multiple-unit control and can therefore be operated in trains as desired. They could be supplemented by some of the company's thirty-two-passenger single-truck city cars. The latter in turn would be replaced by one-man safety cars which the company purposes using. In fact, one of the present cars is being equipped with the automatic devices that are used in one-man operation.

To use its rolling stock more efficiently, the railway is planning a prepayment area at the steel shipyard, and the Liberty Shipbuilding Company has already agreed to consider staggering its working hours. Rates of fare have not yet been fixed.

While the Wilmington company is in no immediate need of cars it is looking ahead to be prepared for the maximum. Probably the purchase of some large second-hand cars with multiple-unit control will be favored. Incidentally, it may be remarked that as the plants are located on the Cape Fear River, boat service by other interests is not out of the question.

Housing Movement in Wilmington

Proof of the lively interest which Wilmington is taking in the shipbuilding program is presented in a citizens' co-operative movement to pledge $1,000,000 for the building of homes for the shipworkers. Apparently no one locality is to be developed, as at a public meeting held on May 9 lots from various parts of the city were offered for building. In several instances the speakers said building now would be a personal hardship but they would be glad to do it for the sake of winning the war. All the building and loan associations of the city also are urging their members to subscribe funds. One project is to secure twenty-five subscriptions of $25,000 each with the rest coming in amounts as low as $10. Wilmington evidently is not going to ask the Emergency Fleet Corporation to do it all!

85,000 Words at One Hearing

President Brush Performs Remarkable Feat at Recent Hearing on Necessity of Financial Relief of Boston Elevated

MATTHEW C. BRUSH, president Boston Elevated Railway, recently appeared before the joint committee on street railways and metropolitan affairs of the Massachusetts Legislature and presented a statement that will undoubtedly hold the record in important respects for a long time to come. Beginning at 11 a.m., he talked during the morning, afternoon and evening with two intermissions for meals, at the rate of more than 225 words a minute, until nearly 10.30 p.m. The report of his address and answers to questions fills a total of 236 typewritten pages and contains about 85,000 words.

So closely did Mr. Brush hold the attention of the members of the committee that no one left the room or gave the slightest attention to any other matter than the remarks of the speaker at any one of the sessions. During the entire hearing not a question was asked to which Mr. Brush was not ready to make a quick, complete and satisfactory reply. So obviously frank were the answers and so obviously helpful was the intent, that before the hearing had progressed to great lengths, the entire attitude of all concerned was that of mutual helpfulness in a common cause.

War Problems Before Oklahoma Association

Recent Meeting Marked by Patriotic Consideration of Current Questions—Value of Public-Relations Work Is Emphasized

THE seventh annual convention of the Oklahoma Gas, Electric & Street Railway Association, held in Oklahoma City on April 22-24, was marked by an attitude of unusual seriousness. The members seemed to realize that present conditions call for co-operative effort, for patriotic willingness to share their portion of the war burdens and for an improvement in methods of dealing with the public.

Numerous addresses were made, and below are published abstracts of those most closely connected with the electric railway industry. The names of the new officers of the association follow: J. F. Owens, vice-president and general manager Oklahoma Gas & Electric Company, president; C. S. Thompson, general manager Shawnee Gas & Electric Company, first vice-president; J. W. Shartel, vice-president and general manager Oklahoma Railway, vice-president, and L. W. W. Morrow, University of Oklahoma, secretary-treasurer.

Relation Between Public and Utility

Public Favor Is Most Valuable Asset of Company—Service Must Be Paid For by Patrons—Changed Conditions Should Mean Altered Rates

BY A. L. MITCHELL
Gas and Electric Engineer, Corporation Commission of Oklahoma

THE Oklahoma commission has gone far during the last twelve months in an effort to harmonize relations between the public and the utilities of the State. In view of the unusual and trying conditions resulting from the war, it has been necessary to restrict service in some instances, to deny requests for extensions or expansion in others and to impose rate advances in still others. The public undoubtedly has been inconvenienced by orders of this character, but it appears that the need has been understood, as there has been no protest.

The fundamental rule governing the relation between the public and the utility, as understood by the Oklahoma commission, was referred to in a recent case involving increased charges for electric railway transportation. In its opinion the commission said:

"The Corporation Commission of Oklahoma conceives it to be its duty to see that the public secures, as nearly as is economically possible, that for which it pays. The commission must also see that the public pays for that which it receives. Where conditions from time to time are making changes in rates necessary, it must prescribe and enforce such changes whether revision downward or revision upward be necessary.

"The commission must take into consideration, as has been done in certain recent cases, the fact that this is an abnormal time; that the individual must pay more for what he purchases than in normal times, and that the public utility must do the same. It follows 'as the night the day' that if the utility must pay more for what it buys, it must receive more for what it sells."

The most valuable asset that any public utility can have is the favor of the public served. The truth of this statement is realized by most utilities at this time. Some are more successful than others in applying their realization of this fact in practice. One of the compensations in the war emergency is that the American people are forgetting supposed differences among themselves in their unanimous hostility toward the nation's enemy. With the public utilities and the public making every effort to be useful in the winning of the war, neither has time to waste in magnifying the importance of a grievance toward the other. It is likely that both will learn that they can work best by co-ordinating their efforts in the building up of the communities in whose best success both can expect to share.

Instilling the Public-Relations Idea

Task of Utilities Is to Get the Public to Make an Intelligent Choice Between Decreased Service and Higher Rates

BY L. W. W. MORROW
Director School of Electrical Engineering, University of Oklahoma

THE task of the utility is to remove the impression that the utilities and the public are working for opposite results—the utilities to squeeze every cent they can from the public; the public to get every cent they can from the utility. The true idea of public relations must be instilled—the utilities and the public are partners; the interests of the employer, employee and the public are one and the same. Co-operation is the keynote to the welfare of each.

It does no good to appeal to the sympathy of the average citizen—it simply shows ignorance of human nature on the part of the utility management. The utility must approach the public from the standpoint of selfishness and self-interest. It must show the public that the utility's interests are the public's interests, and that a consideration of utility conditions will mean money in the pocket of every user of the utility's service.

TEARING UP TRACKS WILL NOT SOLVE THE PROBLEM

How shall the utility present the facts to the public so as to get the public to consider them? The utility, from the public's standpoint, is at present an interested party, and any statements or figures of the utility are questioned on sight. Some argue that the only method of getting the public to consider the utility is for the utility to decrease service. Tear up a few street-car lines, and refuse a few extensions, and the public is placed in a position of the aggressor and not the utility. Then the facts of the utility's condition will reach the audience desired and the public will acquiesce in the principle that service should be paid for on a reasonable basis.

This method will work as a temporary expedient, but it is wrong as a working policy, because of the psychological fact that the public never welcomes proof that it

is wrong. Even though convinced of the justness of the utility's act, the public would consider itself ill-treated in that the utility made no effort to show its condition before discontinuing service. The public is accustomed to have the utilities take the steps necessary to give it adequate service and does not relish the work necessary to get service through its own action. The public also feels worse in that it is practically forced to grant a rate increase.

"More-than-Necessary Service" the Slogan

Extension of service and more-than-necessary service are the watchwords of successful utility operation. The task of the utilities is to show the public that present conditions mean decreased service or advance in rates, and to get the public to accept voluntarily the increase in rates upon decision of their representatives.

The gist of every publicity argument should be that unless rates are advanced, service will be decreased. The utility must show:

1. That it is not getting a fair return on the actual capital invested.
2. That its financial condition is not temporary with relief in sight, but is in fact increasing in seriousness with the lapse of time.
3. That the increase is necessary in order to furnish adequate service of the kind the public requires.
4. That the increase desired is only reasonable and just and that the company's motive in asking the increase is only the application of fair dealing to present conditions.

The public must be shown the same things a commission is shown, but it must be shown these things in a simple and direct manner—no lengthy treatise on going value, depreciation, reproduction new, etc., appeals to the public. Simply show that operating expenses are so much, operating revenues are another sum, and the difference is inadequate to furnish the service desired by the public.

Put Personality Into Campaigns

The utility publicity man must have several essential characteristics. He must be able to marshal his facts and present them in a telling and effective manner. He must believe in his own case enthusiastically and must be perfectly frank with his audience. He must be the personality of his company—no one cares about the hardships of Blank Electric Company, but John Jones is a definite personality and his views and opinions are quoted and considered. The personality of the manager of a utility solves many vexatious problems in public relationship

There are many methods for obtaining publicity—the newspapers, newspaper advertising, circulation, posters and street cars, addresses before civic bodies, personal relationship between the employees and the public are all legitimate means. The newspaper is the chief agent as it reaches the maximum number of people. The publicity of the individual plant must be handled locally—no amount of generalization will be read by the local citizenship. The manager of the local utility is the one person to handle the public. A central bureau can compile his facts and arrange his material, but the manager's personal touch is essential in getting these facts across to his public.

A lecture bureau is a great help in presenting matters of a general nature to civic bodies, but every question that is in dispute should be personally presented by the manager, even though in many cases he is far from being a fluent speaker or logical floor thinker. The importation of a high-grade man by the utility to handle local disputes is poor policy, because it strikes the local people as a plan to talk them out of their side of the case by means of hiring an able lawyer. Instinctively, the local people take an antagonistic mood. The manager, however, lives in the community and is one of the citizens, and on a common basis with the local people from their point of view. Outside help can marshall the facts for the manager and obtain his material, but it should not attempt to intervene directly in local disputes.

How Should Utilities Be Taxed?

Same Valuation Should Be Used in Taxation as in Rate-Making—State Assessment Board is Best

By Prof. F. F. Blachly
University of Oklahoma

THERE are three theories of equality of taxation as applied to utilities: (1) Utilities should not be taxed at all. (2) Utilities should be taxed more than other businesses. (3) Utilities should be taxed equally with other businesses.

The last theory probably has more advocates than either of the other two. All admit that it is difficult to obtain perfection in trying to establish a basis of equality but that such an attempt should be made.

Real equality can only be obtained by classifying property according to special conditions and circumstances. It is much easier to state this general principle than it is to apply it to concrete cases.

The taxation of utilities at their fair market value is the method used in Oklahoma in addition to the gross revenue tax. Thus, to speak theoretically, the property of public service corporations is assessed in the same manner as other property with the exception that the assessing board is different. Were tangible property alone to be considered and were the tangible property of a public service corporation not very different than that of a private corporation, this method might produce fair results. But it is the intangible assets of public utilities which cause the difficulties.

It is left to the discretion of the board to determine the assessment on these extremely elusive values. Since the basis is not the actual property itself, but this property in its relationships with the intangible property, the board has no guiding star in determining what the assessment shall be. The result is that, in Oklahoma at least, there seems to be no stable basis for determining value. Several factors undoubtedly are taken into account, such as capital stock, bonded indebtedness, total revenue, expenses, interest and dividends. I have been unable in any concrete instance to determine just what was the basis for fixing the assessment.

Rate Valuation Should Be Used

It would seem evident that the same valuation should be used as the basis for taxation as is used in rate making. If franchises, good-will and going value are considered as a proper basis for the determination of rates,

they should also be considered when it comes to taxation. If, however, franchises, etc., are not considered in determining rates, certainly they should not be so considered when determining the value of the property for the purpose of taxation.

Particularly in undeveloped or new regions, I do not believe that it is either expedient or possible to remove all speculative value from a public utility and still have it privately owned. Capital simply will not invest in such enterprises. The natural result of trying so to regulate utilities must ultimately bring about government ownership.

Evidently all public utilities should be assessed by a state authority, as opposed to local authorities, for many utilities are not local in nature and even where they are it is almost impossible to secure assessors with a sufficient grasp of the problem to perform their functions properly. The assessing board must have large powers of determining value and it should be made as free as possible from political control. Perhaps the best way to secure this end is to have members appointed for a long term if not for life. The members should be experts in law, accounting, economics and business management. While much of this training can be secured through formal education, much of it must come through the handling of large affairs.

In order to carry out the principle previously stated, that the same base should be used in determining taxes as is used in determining rates, there should evidently be a close relationship between the rate-regulating body and the assessing body. I am not at all sure, however, that the rate-fixing body and the tax-assessing body should not be the same. Many advocate a regular tax commission which should assess all property in the State, including utilities. The only difficulty of such a scheme might be that it would either have to duplicate to a large extent the work of valuation now done by the corporation commission in determining valuations, thus requiring a large and expensive staff, or else the tax commission would have to adopt the value of utilities certified to it by the corporation commission.

War Needs of Electric Railways

Decisive Increase in Revenues Is Needed to Enable Railways to Stand Present Strain

BY G. B. TREAT
Assistant Manager Oklahoma (Okla.) Railway

THE one thing which the public lost sight of, and which should be the key to future action, is the fact that on a pre-war basis the electric railway business as a whole was not attractive to capital. The present distress of the utility is not entirely a war result, but it is the culmination of attempting to carry the burdens of previous years without adequate revenue.

The continued efforts to reduce operating expenses during the last few years have always been made at the expense of the property. Renewals and replacements which should have been made were passed by, so that at the opening of the war the utilities were not in shape to stand the added burden.

If all the relief thus far asked by the utilities were granted, the returns would still be wholly inadequate to meet the present-day demands. Requests for added revenues have been limited by the fear that an adequate return would call for such a large increase as to raise a storm of protest which would ruin all chances of gaining any immediate aid. Had the relief asked for now been applied for six years ago, properties would have been in shape to stand the present strain.

Aid necessary now is not the nominal increase asked for, but a decisive increase, which would aggregate probably not less than 50 per cent for all the electric railways over the country. Failure to receive this will react against the public interest in a way over which the companies will have no control.

Missourians Keenly Alive to Rate Needs

Majority of Addresses at St. Joseph Convention Discuss Increasing Costs—Concerted Effort to Educate Public Is Urged

THAT sweeping increases in rates are necessary to afford relief to public utilities in Missouri was the consensus of opnion at the convention of the State Association of Public Utilities in St. Joseph, Mo., on May 17 and 18. The utility operators have ceased for the time being to discuss detailed problems of operation and are concentrating their attention upon the fundamental question of securing adequate net income.

The convention was opened by addresses from two Missouri mayors. Mayor J. C. Whitsell of St. Joseph expressed willingness to aid the local utilities in educating the public to the fact that net earnings are only a small percentage of the receipts. Mayor H. W. Kiel of St. Louis stated that changing conditions are making the public see the value of utility service. He expressed the belief that higher rates would have to be paid.

In the absence of the president, Bruce Cameron, superintendent of transportation United Railways of St. Louis, his address was read by Secretary F. D. Beardslee. Mr. Cameron dwelt at length on the St. Louis electric railway situation. Last February the employees demanded an increase in wages, but the money to pay it could not be secured under the rates in effect. Application was made for an increased fare, but the city of St. Louis opposed this. The commission, however, has now granted the increase, and the workmen have secured increased wages. Whether the city of St. Louis will attempt to fight still further in the courts and take the responsibility of bringing on a strike remains to be seen. Mr. Cameron favored the skip stop as a conservation measure both for saving coal and for saving time. He predicted that the prices of labor and material would reach higher levels and that high prices would continue for a long time, even after the war is ended. He recommended that changes be made to take these predictions into account, one suggestion being for the coinage of a 7½-cent piece.

J. S. Tritle, manager of the St. Louis office of the Westinghouse Electric & Manufacturing Company, in a paper on "How the Manufacturer Is Meeting the Problems Created by War," presented data on the increased business which his company is doing. On June 30, 1914, the company employed 11,702 men, and on Feb. 28, 1918, it had 36,534. When war broke out

on Aug. 1, 1914, the unfilled orders amounted to $8,000,000; on April 1, 1918, they totaled $153,000,000, exclusive of the gun business of the New England Westinghouse Company.

National Welfare Demands Utility Preservation

Among the other addresses of interest to electric railways was one by Col. Philip J. Kealy, president Kansas City Railways, on "The National Movement for Increased Revenue." This sounded the keynote of the convention in the following words:

"We are here to work out plans not to reduce operating costs or to effect small economies, but to preserve the very existence of the industry itself. One of the principal things we now have to do is to effect that change in our own psychological attitude that we must later effect on the general public. We must get away from our local viewpoint with all its prejudices and face our problem as a national emergency. We must, in our own minds and in the minds of the public we serve, stamp our companies with a national character and have them considered as a vital and essential part of our war preparations."

The remainder of the paper was a résumé of what has been accomplished nationally along this line and what should still be done. In conclusion Colonel Kealy said:

"The situation is in the last analysis a final test of state regulation. Unless regulation is elastic enough to meet the exigencies of an abnormal situation and to preserve and make possible the service of the companies, it has failed and some other method must be adopted to handle the situation. The commissions face a grave responsibility. In this connection our efforts can be of some material assistance. The commissions have no way of presenting the facts to the people from whom they derive their authority. We must do everything possible to see that the public is thoroughly informed of the necessities of the situation."

The Public Must Be Told

The discussion of Colonel Kealy's remarks brought out the point that this work of public education must be done by newspaper advertising, by personal explanation to influential citizens and by all other available means of disseminating information. The question of how to answer the argument that a utility should not break rate contracts, even though it is losing money, also came up. Several good answers were suggested. One form of explanation was that a utility contract is a long-term agreement based on normal times, and that in an abnormal period it is better for both parties to readjust the contract than to have unprofitable and unsatisfactory service.

The address by H. Wurdack of St. Louis on "The Effect of War Upon Utilities" was a discussion of the increased burdens of operation. The speaker concluded that: (1) Regulation will only be tolerated by the American people as long as it seems to work to their advantage; (2) laws and limitations made in peace times to govern peace conditions are in many cases found to be wholly inadequate, improper and inoperative in a war emergency; and (3) commissions, local authorities and communities must allow a liberal and speedy remedy if the total destruction of utilities is to be averted. He also suggested as remedies that fares should be increased sufficiently to reimburse companies for losses already sustained and to cover further increases in costs, that companies should be relieved from paving, tax and other similar burdens and that some means should be provided for financing necessary work at a reasonable rate.

Another who took part in the convention program was J. A. Whitlow, engineer with the Missouri Public Service Commission. Mr. Whitlow declared that the commission, before making any decisions, had been requiring extensive publicity regarding the details of all rate increases in order to maintain favorable public relations for the companies.

As a fitting culmination to the discussion on higher revenues, the resolutions committee submitted a statement which the association, acting as a committee of the whole, will later present to the Missouri Public Service Commission. The purport of the resolution is that all public utilities are entitled to increases in rates sufficient to cover increased costs, and that new rate schedules should not be suspended by the commission until an adverse showing had been made to justify suspension. Furthermore, the resolution declared that all franchise requirements not essential to the maintenance of service should be discontinued for the duration of the war.

Coal Problem Will Be More Serious

Governor Wallace Crossley, fuel administrator for Missouri, predicted more serious coal troubles this winter than prevailed last winter. He expressed the opinion that the activities of the national fuel and transportation departments should be co-ordinated. In the subsequent discussion many operators testified that the grade of coal now being delivered from mines is twice as high in ash as formerly, and that a saving of 30 per cent in coal cars could be secured by compelling mines to ship clean coal. A committee is to be appointed to supply Governor Crossley with accurate data regarding the inferior coal service now being rendered. M. F. Henry, secretary of the Missouri fuel administration, stated that higher freight rates on coal, amounting to from 15 cents to 50 cents a ton, should probably be expected within six weeks.

The officers elected for the ensuing year are: President, J. H. Van Brunt, St. Joseph; first vice-president, J. M. Scott, Kansas City; second vice-president, L. P. Andrews, Sedalia; third vice-president, H. Spoehrer, St. Louis, and secretary-treasurer, F. D. Beardslee, St. Louis. The executive committee is P. J. Kealy, Kansas City, and B. C. Adams, Joplin; and the public affairs committee is V. L. Elbert, St. Joseph; J. F. Porter, Kansas City; Bruce Cameron, St. Louis, and E. C. Deal, Springfield.

The results of the first Thrift Stamp Day were so satisfactory that the National War Savings Committee of Greater New York has decided to set aside hereafter every first day of each month as Thrift Stamp Day, and all business houses have been asked to co-operate and make a special drive to boost the sales of Thrift and War Savings Stamps on those days.

Freight Motive Power Equipment

Present Power House and Substation Equipment Is Sufficient if Freight Haulage Is Confined to Off-Peak Hours

BY G. M. WOODS
General Engineer, Railway Department, Westinghouse Electric & Manufacturing Company



SAND SPRINGS RAILWAY OIL TANK TRAIN HAULED BY A 50-TON LOCOMOTIVE

MANY electric railroads appreciate the possibility of increasing their revenue by freight train operation but do not engage in it because they assume that increased investment for substation and feeder capacity will be necessary to handle the power drafts. A properly designed freight locomotive capable of hauling a 250-ton train on a 4 per cent grade or a 1500-ton train on the level will produce no higher current peaks than a high-speed limited passenger car on the same line. Freight service is operated by many roads during the night. It is well that these off-peak hours should be so used instead of permitting the earning power to drop to zero for four or five hours every night. In fact, freight service need not add a single kilowatt to the daylight or evening peaks. It is inherently difficult to obtain a high load factor on most electric railroads and the peak load, rather than the continuous load, determines the substation and feeder capacity.

In Fig. 1 the current taken by a 50-ton interurban car equipped with four 125-hp. motors, operating on grades up to 4 per cent, is compared with that required by a 45-ton low-speed locomotive hauling a 240-ton train up the same grades. The balancing speed, balancing current and accelerating current for 1¼ m.p.h.p.s. acceleration of the 50-ton passenger car are shown by curves *A*, *A*-1 and *A*-2 respectively. The balancing speed, balancing current and accelerating current for 0.1 m.p.h.p.s. acceleration of the 45-ton locomotive hauling the 240-ton train are shown by *B*, *B*-1 and *B*-2 respectively. Attention is called to the fact that the passenger car requires a much higher starting current than the 285-ton freight train although in this particular case, on the heavier grades, the balancing current of the locomotive with trailing load is slightly higher than that of the passenger train.

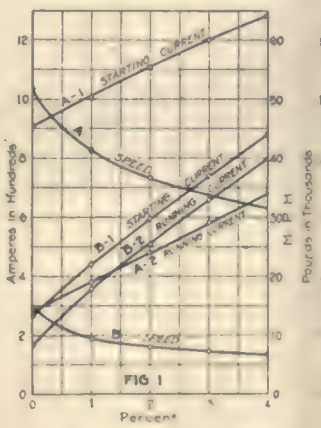


Fig. 1—Comparative Starting and Running Currents Taken by an Interurban Passenger Car and Low-Speed Locomotive

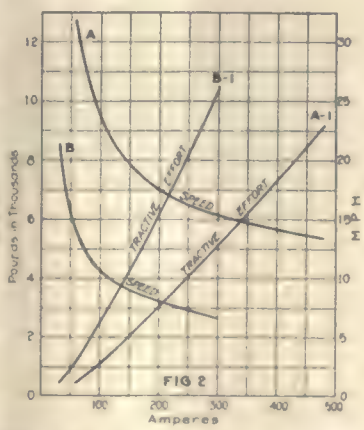


Fig. 2—Comparison of Motor Characteristics for High-Speed Car and Low-Speed Locomotive Motors

LOCOMOTIVE AND PASSENGER MOTORS COMPARED

LOW-SPEED LOCOMOTIVE GIVES HIGH TORQUE PER AMPERE

Freight motive power must be able to exert very high drawbar pull as a primary requisite. Speed usually is secondary. In developing the high drawbar pull, it is essential that the current required should be kept to a minimum. Therefore, the chief advantage of a low-speed locomotive motor equipment is that a very high torque or turning effort is developed per ampere, permitting the locomotive to haul heavy tonnage with relatively low drafts of power.

Low-speed motive power equipment not only reduces the power peaks, but also reduces the total power required to haul a specified weight of train over a given line. This is true because when operating at low speed the frictional and wind resistance of the train is lower, the line losses are lower and less energy is dissipated in braking. Furthermore, a locomotive in freight service spends much of its time on sidings and in switching cars. The individual movements are usually short and must be made at low speeds with the result that the high-speed locomotive is at a disadvantage from the standpoint of safety

and ease of operation, while at the same time the proportion of energy wasted in rheostats and brakeshoes is increased by the short runs.

HIGH-SPEED MOTOR DRAWS 75 PER CENT MORE CURRENT FROM THE LINE

In Fig. 2 a comparison is made of the characteristic curves *A* and *A*-1 of a high-speed motor and *B* and *B*-1 of a low-speed motor of the same weight and general type of construction, but designed for locomotive service. The curves for both motors are based on the same gear ratio and wheel size. It will be noted that for any given tractive effort, the current taken by the high-speed motor is approximately 75 per cent greater than that taken by the low-speed motor and that the speed of the former is correspondingly higher. In some cases where low-speed operation is essential, high-speed motors have been connected in pairs of two in series and thus operated at half-voltage and a corresponding speed reduction obtained. This method of operation results in greatly reduced efficiency. It must be borne in mind also that the motor output at half voltage is approximately half the output at full voltage.

The adaptability of the low-speed freight handling equipment to work without overloading the substation is well illustrated by the following case:

A trailing load of 240 tons was to be started on a 3 per cent grade located at a substation of 300-kw. continuous capacity and capable of 100 per cent momentary overload. With 25 per cent adhesion a locomotive weighing 45 tons was required. If this locomotive had been equipped with high-speed motors: *A*, Fig. 2, the starting current would be 1280 amp., thus loading the substation to 768 kw. or in excess of its capacity, but with four low-speed motors; *B*, Fig. 2, the starting current was 740 amp. and the corresponding substation load was 444 kw. or within the overload capacity.

Further, if this service is started about the time that some of the passenger trains begin to go off the line for the night and ended at a time when the early morning trains are coming on, the improvement in the load factor will be considerable.

Motor combinations during acceleration are facilitated by equipping locomotives, as well as cars, with an even number of motors. Most freight equipments have four motors. The following fundamental explanation of the operation of the control apparatus applies to 600-volt, four-motor equipments.

Placing all four motors in parallel across the line with sufficient resistance in the circuit to limit the first rush of current to a safe value is a most uneconomical and an obsolete method of starting any car or locomotive equipment. The gradual cutting out of this series resistance holds the current, and hence the torque, within relatively close limits as the locomotive accelerates. Control of this type is called "rheostatic."

The control in most general use is known as "series-parallel." In this, the motors are permanently connected in two groups of two motors in "parallel." In starting, these two groups are first connected in series across the line with a variable series resistance and then the two groups are connected in parallel. With series-parallel control, there are two economical running points.

Three-speed control is better adapted to freight operation, because it provides one more economical operating speed than the series-parallel type to care for switching

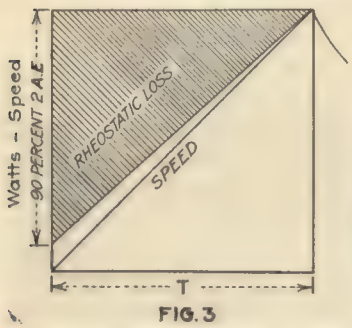


FIG. 3

Fig. 3—Rheostatic Losses for Rheostatic Control

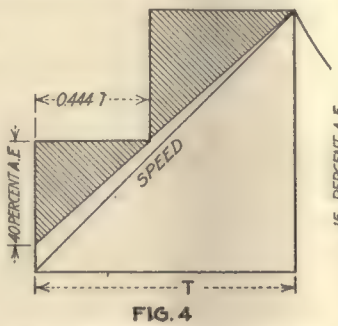


FIG. 4

Fig. 4—Rheostatic Losses for Series Parallel Control

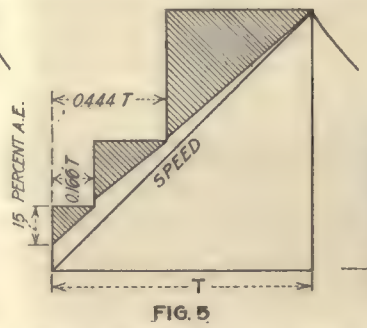


FIG. 5

Fig. 5—Rheostatic Losses for Three-Speed Locomotive Control

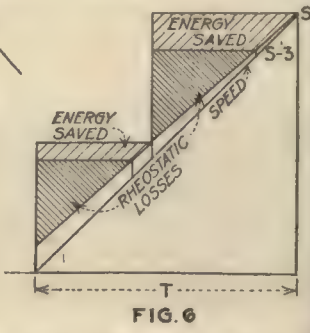
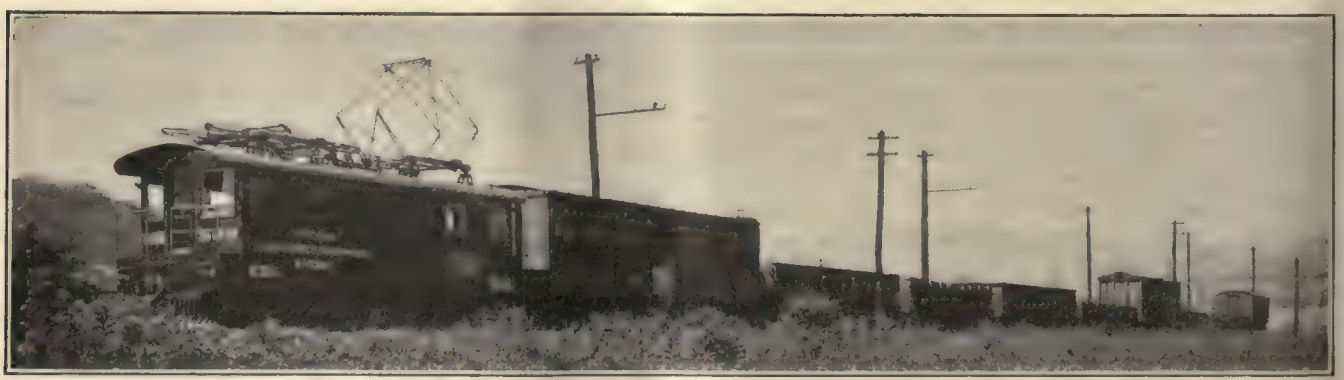


FIG. 6

Fig. 6—Energy Saving Effected by Field Control

DIAGRAMS OF RHEOSTATIC LOSSES WITH VARIOUS TYPES OF CONTROL



CHICAGO, LAKE SHORE & SOUTH BEND RAILWAY FREIGHT TRAIN HAULED BY A 72-TON LOCOMOTIVE

and other low-speed movements. With this method the motors are first connected in "series," then in "series-parallel" and finally, in "parallel" with proper proportions of resistance in each step to secure smooth acceleration. In this scheme, the transition from full "series" to "series-parallel" is effected either by unit switches or some type of changeover switch. There is the advantage in the former scheme that the unit switches permit the motive power tractive effort to be maintained continuously from full "series" to full "parallel."

The shaded portions of Figs. 3, 4 and 5 represent the rheostatic losses of the three foregoing types of control respectively.

A = Accelerating or starting current per motor;
E = Trolley voltage;
T = Time required to reach speed with all resistance cut out with motors in full parallel.

The rheostatic losses with two-speed series-parallel control are 50 per cent less than with rheostatic control, while the three-speed control effects an additional saving of 10 per cent.

An additional feature of design that is most desirable in locomotive service is field control, which regulates the speed of a series motor by varying the effective field turns, thus considerably reducing the rheostatic losses. A very important advantage for freight motive operation is that four economical running speeds are provided with ordinary series-parallel control, thus the running notches of this control are "series" and "parallel" on full field, and "series" and "parallel" on short or normal field. Field control virtually provides a low-speed motor with a maximum tractive effort per ampere for starting or low-speed running, while the higher speed winding is available for road or any other operation that makes a higher speed desirable. The energy saving effected by field control is illustrated in Fig. 6.

Increase in Tramway Fares Essential

As a consequence of the recent wage award of the committee on production, it is said to be essential that tramway fares in Great Britain be increased. This has already been done in many places, but in some cases statutory restrictions prevent necessary revision. In view of this limitation a resolution was passed at a conference of tramway employers and representatives of the unions asking that the government promise that it will take immediate steps to authorize an increase of the maximum tolls and charges, whether statutory or otherwise, which may be demanded on all tramways in an amount to be decided by the Board of Trade. The resolution was signed on behalf of the Municipal Tramways Association by J. B. Hamilton; on behalf of the Tramways and Light Railways Association by R. J. Howley; and on behalf of the National Transport Federation by R. Williams.

As stated more in detail in the "London Letter" this week, Sir Albert Stanley has suggested the appointment of a select committee of the House of Commons to consider the matter. It is believed that the appointment of such a committee would probably prove the best means of facilitating the carrying out of the suggested legislation with the least delay.

An Epoch-Making Law

President Brush Believes that Public Control for Boston Elevated Is Fundamentally Sound—Regulation with Responsibility the Aim

THE act of May 22 providing for the public control of the Boston (Mass.) Elevated Railway is the biggest, strongest, finest piece of legislation ever passed in the electric railway field. Such is the opinion of M. C. Brush, president of the company, as expressed to a representative of the ELECTRIC RAILWAY JOURNAL. The signing of the act was noted in the issue of May 24.

Mr. Brush believes that the plan has all the advantages claimed for public ownership with none of the disadvantages, and it is fair to all interests concerned—car rider, investor, employee and the general public. Based upon the integrity of the Commonwealth itself, it assures a square deal to the 6000 Massachusetts citizens who have invested their money in this property, and it provides a means of securing improved service for the community at actual cost. For a period of four years it compels the stockholder to take less than 6 per cent return upon the par value of his investment, but during this period the car-rider will also carry his share of the burden in the shape of a less satisfactory service than would be provided in normal times. Eventually the car rider will get his service at actual cost, and the future investor in the property will have a fair deal.

Continuing, Mr. Brush said:

"The act permits the community to realize upon its confidence in the management under public control, whereas public confidence in private management under private control has been difficult if not impossible to maintain under recent and present economic conditions. The public control of the company will unquestionably permit many improvements which cannot be satisfactorily effected otherwise. One of these matters is the reduction of stops; another is the provision of a volume of car service expressing the desires of the community, but at its true cost.

"The appointment of the trustees by the Governor is a strong point. This gives the public a real share in the management of the property, since the trustees are appointed by the elected chief executive of the State. The length of their terms, ten years each, minimizes the possibility of politics having an unfortunate effect upon the management.

REGULATION WITHOUT RESPONSIBILITY IS WRONG

"In my opinion, the usual scheme of public utility regulation by commissions without responsibility for the results of management is wrong. The solution of the electric railway problem in the United States does not lie in commission regulation and the 6-cent fare. To attempt to meet present economic conditions in this way is like putting arnica or witch-hazel on a cancer; it may temporarily increase the comfort of the patient, but it absolutely offers no cure for the condition.

"In the Boston act we have a board of trustees responsible for results; the fare and the revenue will be measured by the total service cost as carefully defined in the law, and the public can have exactly the volume and the character of service for which it desires to pay. The act will prevent the car rider from being forced

to meet costs which are not properly his, and for the first time in electric railway legislation there is no limit set upon the revenue to be supplied to meet the real cost of the service, including of course the return upon the investment.

"Speaking of this investment, I want to emphasize the fact that every dollar of the money which has gone into the company's securities has been put into the property with the consent of the Massachusetts Railroad Commission and the Public Service Commission; that within the last two years surely not less than 150 special investigators have literally turned this property inside out and examined every last detail of its operations and management, with the result that not $1 of water has been found in its securities. Moreover, there has not been a suggestion of incompetence, inefficiency, dishonesty or imprudence brought forward by a single responsible investigator.

"The present act passed the Legislature by a vote of 157 to 29, in both houses combined—a result which never could have been attained unless every newspaper, municipal and town government, and State official concerned had entire confidence in the organization which has been operating the road. The company's stock has advanced from $27 to $74 per share in a period of about three months—a fact which speaks for itself.

Property no Longer a Business Venture

"In this bill the Legislature has done for the Boston Elevated Railway something which it has done for no other company in the State, *i.e.*, it has pledged the credit of the Commonwealth to guarantee to the stockholder that his investment shall have its fair return even as the public receives a corresponding service at definite cost. The act goes further than any previous one in providing for the necessary revenue for a fair return by taxation in the event that fares, transfer arrangements, etc., should yield an insufficient return. This means that the operation of the property is no longer to be classed as a business venture but as a genuine public service, for which actual costs must be met by the community and the car riders. I believe that the act is fundamental in scope, and that it will be the basis of other public utility rate agreements as its principles become understood and appreciated.

Government Ownership Is Not Desirable

"Of course, in expressing my opinion on this bill it must be distinctly understood that I am talking entirely about a public utility financed under Massachusetts laws and not about private enterprises for either semi-public or private purposes. The Massachusetts laws since 1873 have been extremely strict with regard to electric railways. Since all financing of this company has been done under these laws and since the point had been reached where it was evident that the company could not secure sufficient revenue to invite additional capital for transportation facilities, something of the character that has just been passed was inevitable.

"I am not in favor of government ownership or necessarily government control. I believe that if public utilities as well as private utilities are given opportunity to run their properties on a business basis with the privilege of making such charges for their manufactured article whether it be transportation or something else, as will invite additional capital, the results will be better than to have the government own or operate all industries in the country."

Salient Features of New Act

The terms of the proposed enactment were summarized in the ELECTRIC RAILWAY JOURNAL of April 20, page 778. The only essential change in the final act, which now awaits only the formal approval of the stockholders for enforcement, was in the provision for the appointment of the trustees. In the first bill, two of the five were to be appointed by the Mayor of Boston and three by the Governor of Massachusetts. This was changed so that the law provides for all appointments to be made by the Governor. Otherwise the law is substantially the same as the original bill, despite a few changes in phraseology.

For the convenience of readers, however, there is again published herewith a résumé of the main points of the new act:

1. The company is to be managed by five trustees, appointed by the Governor for ten-year terms at a salary of $5,000 per annum.

2. The period of public control shall be ten years or longer at the option of the Commonwealth. The Commonwealth can terminate the public control at the end of the ten-year period or thereafter by legislation passed two years before the date fixed for termination.

3. The trustees operate the property, have power to regulate fares and transfer privileges, and determine character and extent of service, without being subject to the control of any State board or commission.

4. The company shall raise $3,000,000 by sale of preferred stock at not less than par, $1,000,000 to be used as a reserve fund and $2,000,000 for additions and improvements.

5. Fares must be sufficient to meet the cost of service, including depreciation and common dividends at the rate of $5 a share for the first two years, $5.50 for the next two years and $6 during the balance of the period of public operation.

6. The trustees shall adopt a schedule of eight different grades of fares, of which four shall be below and four above the rate of fare first established. The schedule shall be increased when the fare is changed, so that there shall always be not less than four above and four below the existing fare. The trustees may change the method or basis of fare establishment or regrade the schedule at any time.

7. Whenever income is insufficient to meet the cost of service, the reserve fund shall be drawn upon; if more than sufficient, the excess shall be transferred to the reserve fund.

8. When the reserve fund exceeds by 30 per cent or more the original amount and the income during the preceding three months exceeded the cost of service, the next lower grade of fare shall be adopted within one month. When the reserve fund is less than 70 per cent of the original amount, and during the preceding three months the income was less than the cost of service, the next higher grade of fare shall be similarly adopted. The fare shall continue to be decreased or increased if the reserve fund is above or below said limits. In determining the amount of the reserve fund, there shall first be deducted any amounts paid by the Commonwealth under the next section.

9. If the reserve fund at a half-year period is insufficient to meet the deficiency in cost of service, the State shall make up the deficit and assess this upon cities and towns in which the company operates. When reimbursed from the reserve fund, the State shall distribute the amount among the communities assessed.

10. At the end of the period of public control, the company shall revert to the board of directors, who may continue to operate it on the service-at-cost plan with a flexible fare and pay $6 a share in common-stock dividends.

11. The State has the option of taking over the property by assuming the liabilities and paying in cash an amount equal to that paid in by the stockholders.

AMERICAN ASSOCIATION NEWS

Connecticut Section Hears About War

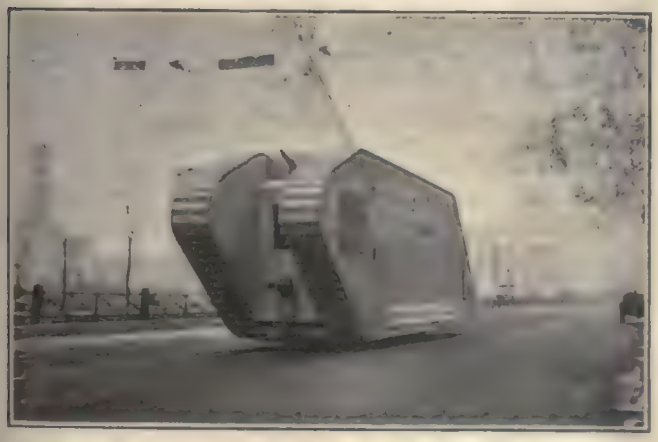
Returned Sergeant from General Pershing's Forces Tells What the Soldiers Need at the Front

TWO HUNDRED AND TWO members and guests attended the combined meeting and dinner of the Connecticut Company Section at the Hotel Stratfield, Bridgeport, on May 16. The first speaker was the Mayor of Bridgeport, Hon. C. B. Wilson. He was followed by one of General Pershing's men, Sergeant Reilly, just returned from the trenches, who told the needs of our soldiers "over there." Mr. Steinke, a cartoonist of one of the Bridgeport local papers, then showed how cartoons are drawn. Hon. E. T. Buckingham, compensation commissioner of the Fourth Congressional District, then gave an interesting talk on the compensation act. Rev. Alexander Allison, Jr., was the concluding speaker and gave a patriotic talk on the war.

As a supplement to the report of the April 30 meeting of the Connecticut Company section, printed in the issue of this paper for May 4, the following notes are of interest. At the meeting the membership committee reported that the section had enrolled to date 343 members, of whom forty-nine have left the company's employ, leaving a total net membership of 249. An announcement was made that the Rhode Island Company section will invite the local members to a joint meeting to be held at Providence probably in June. This is a return courtesy for the "Rhode Island Night" meeting held some weeks ago at New Haven.

Another Liberty Loan Artillery Tank

IN THE recent highly successful drive for subscriptions to the Third Liberty Loan, employees of the Connecticut Company constructed the "tank" shown in the accompanying photograph. This is similar in many



THE "NATHAN HALE" ALONGSIDE THE "GREEN," NEW HAVEN CONN.

respects to the tank used by the Berkshire Street Railway, Pittsfield, Mass., pictured on page 857 of the issue of the ELECTRIC RAILWAY JOURNAL for May 4, 1918. The Connecticut Company's tank was appropriately named "Nathan Hale."

Accidents in London Cut Nineteen Per Cent

London Safety-First Council for 1917 Reports Wide Progress and Pledges Continuance of Work During the Present Year

AFTER a year of safety-first work, the London (England) Safety-First Council states in its report for 1917 that it will continue to apply itself to the extension of the safety movement. It plans to develop every conceivable means of reducing accidents, to act as a clearing house for ideas pertaining to traffic safety, to collect and collate statistical information, and to consider carefully the effects of the changing conditions of traffic after the declaration of peace, as a result of the increased production of power-propelled vehicles and the release and adaptation, for trade purposes, of a large proportion of the motor vehicles now employed on war work.

The London Safety-First Council, formed as a result of a conference held near the end of 1916, comprises representatives of nine railways, three tramways, five omnibus companies, three vehicle workers' associations, fifteen technical research societies, seven commercial firms, forty-five local authorities (six of which are also tramway authorities) and others. The administrative work is intrusted to six committees and four sub-committees, namely: drivers' educational committee and advisory sub-committee; street safety committee and advisory and street-lighting sub-committees; railway safety committee and advisory sub-committee; publicity committee; general purposes committee and industrial safety-first committee. To this number it is proposed to add a committee to handle the dissemination of safety propaganda among schools.

The work of the council during 1917 was devoted to the conservation of life, limb and property in the greater metropolitan area. The activities of the various committees during the period are described in the report. From Jan. 1 to Sept. 30, 1917, the total number of persons killed was 489 as compared to 577 in 1916 and 578 in 1915, and the number of accidents to persons or property totaled 27,960 as compared to 34,575 in 1916 and 40,730 in 1915. The reduction from 1916 was, therefore, 15.26 per cent for persons killed and 19.14 per cent for accidents.

The suggestions made and approved by the council during the year covered such matters as street refuges, the position of lamp columns, snow cleaning, the whitening of curbs, crossings over footways, lighting of street obstructions, indication of cul-de-sacs, the rule of the footpath, danger signals on street lamps, lighting of main and side streets, lighting of street refuges, diffusion of public street lighting, illuminated signs at tramway stopping places, standardization of lamps on vehicles, air raid shelters, safety device for the front of motor vehicles and queues for tramcar and omnibus passengers.

In connection with the using of queues, it was said that, as the present practice of forming queues at certain places had proved advantageous, it was desirable that a scheme for its extension should be formulated, and that the police, local authorities, tramway corporations and omnibus companies operating in the greater London area be so informed.

Air-Operated Door and Steps Installed at New Brighton

Safety Considerations Prompt the Substitution of Air for Manual Operation—Other Features of the Cars Are Given

THE Richmond Light & Railroad Company, New Brighton, N. Y., operating 32 miles of track on Staten Island, has recently completed the installation of air-operated doors and steps on thirty-two double-truck four-motor cars purchased from the Osgood Bradley Car Company in 1915. When these cars were purchased the doors and steps were manually operated by means of hand levers, the motorman tending the front doors and the conductor the rear. Under the rules existing then and now passengers board at the rear and leave at the front. Some difficulty was experienced with manual operation, the greatest trouble being due to the failure of the steps to fall when the doors were opened. This difficulty became a matter of safety and



FIG. 1—NEW BRIGHTON CAR WITH AIR-OPERATED DOORS AND STEPS

it was decided to overcome all trouble by installing air-operated doors.

A contract for the door engines was made with the Smith-Ward Brake Company, New York, and the engine shown in the accompanying illustration was designed especially for the purpose. This is a 6½-in. center-feed pneumatic engine, packed in dry graphite instead of the customary grease. The movement of the plunger operates a series of levers which in turn open and close the doors. Figs. 2 and 3 show the engine as connected. The two handles on the center post, Fig. 3, are for use of the conductor when this is the rear end of the car. A horizontal turn of about 45 deg. actuates the series of levers and admits air behind the piston. The doors open quickly and a reverse action closes them. Fig. 3 actually shows the front end of the car as it appears in operation. The two handles by which the motorman controls the door movement are visible one on each side of the front window. These work on the same levers and in precisely the same manner as do those of the conductor.

The door opening is 52 in. On some lines where the traffic is well distributed and where there are no congested boarding or alighting points, it has been considered wise to use only one-half of the door during cold weather. This has been accomplished by simply loosening a nut on one engine lever and placing a steel strip across the top of the door to hold it firmly in position. The door operation is interlocked with the control circuit so that when doors are open the power is cut out and the car cannot be started. The steps operate in conjunction with the doors, the height from rail to first step being 14 in., from step to vestibule floor 14 in., from vestibule floor to car floor 9 in., and there is a 3-in. ramp in the car floor.

The cars are of semi-convertible steel construction 40 ft. over-all length and 8 ft. 3 in. over-all width, with a seating capacity of forty-six. The Hale & Kilburn



FIG. 2—PNEUMATIC 6½-IN. CENTER-FEED DOOR ENGINE ON NEW BRIGHTON CAR. FIG. 3—END OF CAR SHOWING DOOR ENGINE, OPERATING LEVERS, SEATING ARRANGEMENT, ETC.

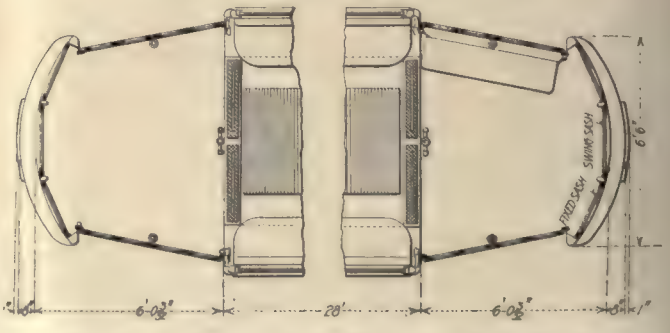


FIG. 4—PLATFORM ARRANGEMENT OF NEW BRIGHTON CAR

walkover seats are arranged six transverse in the center and there are four seats 9 ft. 6 in. long placed longitudinally at the ends. The aisle between center seats is 2 ft. 3 in. wide. As shown in Fig. 3 there is also a slat seat provided on the platform in front of each closed door, the platform being 6 ft. long. Johnson fare boxes are used with a pay-as-you-enter system of fare collection. The cars are equipped with Giant staffless brakes of the National Brake Company and with Automatic Ventilator Company's honeycomb ventilators. Other equipment includes Earle trolley catchers, Providence fenders, H. B. lifeguards, Westinghouse Type 323-B motors and Standard trucks No. 50 with 33-in. wheels.

The Ohio Brass Company's system of electric signal lamps is used. There is one lamp at each end of the

car arranged so that when the main lighting switch is in, a red signal will show at the rear of the car, receiving current from the trolley circuit. In case of accident to the power or main lighting circuit, a red signal will show at each end and two pilot lamps inside the car located at opposite corners, Fig. 3, will be lighted, the four lamps receiving current from a storage battery and being operated by an automatic relay switch. The regular lighting system consists of seven lamps placed in a row down the center of the roof.

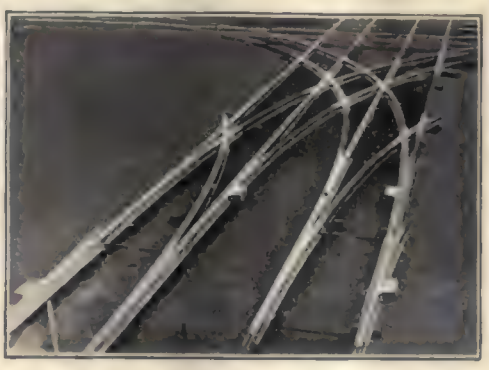
An electric buzzer is located at each end of the car and there are four electric push-buttons located one in each corner, Fig. 3. The buzzers operate from the same storage battery as the emergency lights. Golden Glow electric headlights are used.

Outside-Switch and Double-Switch Types of Special Work Are Common in England

THE outside-switch type of special work, discussed by W. L. Whitlock in the March 16 issue and by M. Bernard in the May 4 issue of the ELECTRIC RAILWAY JOURNAL, is in quite extensive use on English tramway systems.

The accompanying illustrations show some special-work layouts with this type of construction, and the editors of this paper are advised that no particular trouble is experienced with the mate if properly gaged. Trouble can, however, be entirely avoided if both points are switches, the tongues being connected together on facing tracks, whereas on the trailing side they can be either connected or arranged to work independently.







At Left, Double-Switch Type of Construction with Tongues Connected. In Center, Special Work Construction with Outside Switch in Some Runs. At Right, Double-Switch Type of Construction with Tongues Arranged to Work Independently

Two-track layouts with double switches are illustrated. One shows the switches connected, while the other shows the tongues arranged to work independently. These can be set to run to right or left as desired. The particular layouts shown were built by Edgar Allen & Company, Ltd., Sheffield.

The United Railways, St. Louis, Mo., prepared for the introduction of the 6-cent fare on June 1 by converting $31,000 into pennies. The pennies weigh approximately 11 tons.

Difficulties and Precautions Necessary in Storing Coal

The Engineering Experiment Station of the University of Illinois has just completed a study of the problems involved in coal storage and has published the results in a 200-page illustrated book designated as circular No. 6, "Storage of Bituminous Coal." The study was made under the direction of H. H. Stoek, professor of mining engineering. The reasons, advantages and costs of storing coal are given, the kinds and sizes of coal which may be safely stored are described and the many factors entering into successful storage are discussed.

As a result of the difficulty experienced in obtaining coal during the past winter, the more general storage of coal during the spring and summer months is coming to be recognized as the best means of avoiding a coal shortage during the coming winter. Many corporations and individuals will this year undertake for the first time to store large quantities of coal.

The storage of the bituminous coal presents certain difficulties because of its tendency toward spontaneous combustion with its attendant dangers and losses. The methods to be employed in avoiding spontaneous combustion have not generally been well understood and those which have seemed successful in some cases have failed in others. Copies of this circular may be purchased from the Experiment Station.

Conductors to Knit Socks While Not Collecting Fares

The motormen and conductors at the east side carhouse of the Twin City Rapid Transit Company were recently presented with two knitting machines by Horace Lowry, president. If these machines are used to good advantage others may be placed in other carhouses.

The carmen did not like to be outdone by neighboring firemen who they discovered were turning many otherwise idle hours to efficient use by knitting articles for soldiers and sailors. Their ambitions were made known to the Red Cross and resulted in the machines being furnished.

Recent Happenings in Great Britain

Fares Again a Problem—Sir Albert Stanley to Ask House to Appoint Select Committee—Need for Curtailments a Problem

(From Our Regular Correspondent)

In answer to a question in the House of Commons Sir Albert Stanley, president of the Board of Trade, stated recently that he had received a deputation representing a very considerable number of municipal and company tramway undertakings, which urged that owing to the enormous increase of wages and the very heavy increased charges for material, these undertakings receive special consideration in regard to the charges they are making. Sir Albert did not feel he could take upon himself the responsibility of determining that question, particularly in view of the fact that he had stated in the House that the Board of Trade would not deal with the question of increased tramway charges without first referring the question to the House. It was because of that pledge that he promised the deputation that he would ask the House to agree to appoint a select committee to investigate the question.

Relief for Rates a Problem

Municipal tramway services, in many instances, have for some years been so well organized and used by the public that the tramway committees have found themselves able to transfer considerable sums to the municipal corporations in relief of the rates. That condition has lasted so long that it has come to be regarded as normal, and now, when the rates are mounting, corporations are disinclined to accept a smaller amount for transfer or none, although the committees discover that expenses are so much higher that considerations of sound finance would almost forbid any such remittance. There are two means by which the situation can be met. One is to raise the fares, the other to shorten the distances covered by a certain fare. The public does not take kindly to these methods, and the question is also raised of statutory or workmen's fares which cannot be increased at will. In addition the subjects of maintenance and repairs have come forward at Birmingham and Nottingham and elsewhere.

Mr. Priestly Appointed to Liverpool

J. S. D. Moffet, Belfast, has decided not to accept the position of deputy-manager of tramways under the Liverpool Corporation, to which he was appointed, and the tramways committee has appointed Percy Priestly, the general manager of the Oldham Corporation Tramways. Mr. Priestly served his apprenticeship at the Scotia Engine Works, Scotland, and for some five years afterward he was a marine engineer. For six years he was deputy-manager at the Halifax Corporation Electricity Works, and for nine years general manager and engineer of the Mexborough & Swinton Tramways. For the last two years he has been at Oldham.

An important contract for a generating plant has been awarded to Dick, Kerr & Company, Ltd., by the Glasgow Corporation for the new power station in course of erection at Dalmarnock. The contract includes a turbo-alternator set, with condensing plant and step-up transformers designed for a continuous output of 18,750 kw. The turbine will be a single-unit standard Dick-Kerr impulse type machine, arranged to run at 1500 r.p.m. and will operate on steam at 250 lb. per square inch pressure at the stop valve, superheated to 650 deg. Fahr. The turbine will be direct coupled to a 6500-volt, 25-cycle, three-phase Dick-Kerr alternator, having a maximum continuous rating of 24,000 kva. at 80 per cent power factor. The machine will be of the self-ventilating type, provided with fans on the rotor drawing the cooling air through a wet air filter of the Heenan and Froude type. An exciter of the overhung type will be provided. The alternator will be electrically connected to a bank of three Westinghouse single-phase oil-circulated water-cooled transformers, stepping up the pressure from 6500 to 20,000 volts. In connection with these transformers, a separate oil cooler and motor-driven oil-circulating pumps will be provided. The turbine will exhaust into a standard Willans & Robinson condenser, having a surface of 26,000 sq.ft.

Women Conductors Pacified

At a meeting of the war wages committee of the Bradford Corporation, it was reported that the decision of the committee on production with regard to the wages dispute between the conductresses employed on the Bradford tramway service and the tramways committee had been received. The Ministry of Labor had been asked to interpret the award given on March 8, last, by the committee on production relating to tramway and motor-omnibus workers' wages. By that award an advance of £1 a week on pre-war rates was granted, but it was held by the Bradford tramways committee that this, while it applied to the men, did not apply to the women tramway workers, who had been receiving a smaller war bonus than that received by the men. The committee's contention was that under the award the women were entitled to an advance of 4s. a week, making an advance of 13s. a week on pre-war rates. The committee on production has approved this.

Alderman Charles F. Spencer, chairman of the Halifax tramways committee and recently appointed director of National Kitchens, is experimenting with an old tramcar fitted up with ovens and cookers supplied with electricity from the overhead wires. The appearance of the vehicle outside is none too inviting, but inside it is equipped so as to bring cheap, warm and nourishing meals to the doors of the community. Food for the workers had previously been prepared at the central cooking depot in Great Albion Street. Laden with attractive edibles, the traveling kitchen was at noon driven over the tram route to the Fountain at King Cross, a thickly populated industrial part of the borough. There women workers from the factories, women with families, men in overalls, and children all brought dishes, jugs, basins, or other domestic receptacles, to be filled. As soon as the kitchen was opened for business there was a rush for the steaming hot food, which it contained. The experiment will be continued in other parts of the city.

Owl Service Discontinued

At a meeting of the tramways committee of the Birmingham City Council, it was decided, in view of the curfew order and the desire of the government to limit the use of electricity not to run tramcars from the central terminal after 11 o'clock at night. In accordance with the authority given by the City Council, application has been made to the Board of Trade for permission to revise the tramway fares by shortening the penny stages. Under a Board of Trade order 1d. fare covered a journey of 2 miles, and this distance, having regard to the greatly increased cost of working the tramways, is now considered excessive. The ½d. fares hitherto charged for children have been withdrawn on tramcars and omnibuses. Children over the age of three and under fourteen are now carried at half fares, with a minimum fare of 1d. The system of charging 1d. fares for adults on motor-omnibuses has been withdrawn. The minimum fare has been fixed at 2d., and all other stages have been increased by 1d.

Service Reduced in Liverpool

The Liverpool tramway service is to be reduced 30 per cent on government orders. It was expected that the restricted facilities, under which two cars would have to do the work of three, would be operative by the end of May. Notwithstanding the record number of passengers which the tramways has been carrying, it has been found essential to conserve both man-power and energy. The curtailment is general. The North of England, thanks to its possessions of coalfields, is ordered to make a 30 per cent reduction, whereas a 60 per cent cut is required by the services in the south. North is separated from south by a line drawn from Boston to Bristol. London is subject to special arrangements. The service now maintained in Liverpool is only a little below the pre-war standard, but the passenger record has increased by about 30,000,000 a year. The present facilities, so far from being ample, are said to be nothing like equal to requirements, especially as the city has become a much bigger center of both engineering and shipping.

A. C. S.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

A. E. R. A. Meeting Plans

Subjects Already Selected Are Based on Conditions—Accountants and Claims Topics Not Announced

The following program of sessions for the convention of the American Electric Railway Association on Oct. 8, 9 and 10 at Atlantic City has been adopted:

TUESDAY, OCT. 8

Afternoon—American Association.
Evening—American Association.

WEDNESDAY, OCT. 9

Morning—Accountants, Engineering, Claims and Transportation & Traffic associations.
Afternoon—American Association.

THURSDAY, OCT. 10

Morning—Accountants, Engineering, Claims and Transportation & Traffic associations.

All sessions will be held on Young's Million Dollar Pier. There will be no exhibits. At the meeting on Tuesday evening there will be an address by a prominent member of the national government. For this reason it is hoped that all delegates will arrive in Atlantic City on Tuesday.

The programs of subjects made public by the associations show that they are based on war conditions. Those of the Accountants' and Claims Associations have not yet been decided upon, but the subjects, as tentatively adopted by the other associations, follow:

AMERICAN ASSOCIATION SUBJECTS

Railway Revenue—
(a) Necessity for increases and insufficiency of any possible economies to meet need.
(b) Magnitude of increase required, now and in the future.
(c) Difficulties in the way of securing increases. The extent, if at all, to which employees and investors should be required to bear the burdens of increased costs.
(d) How the association can help in securing increases.

Future of Electric Railways—
(a) From the investment banker's viewpoint.
(b) From the operator's viewpoint.
(c) As to municipal ownership.

President's Address.
Address by Member of War Board.
Address by Representative of the National Administration.
Lessons from European Experience.

ENGINEERING ASSOCIATION SUBJECTS

President's Address.
Economies in Operation and Maintenance—to cover production and distribution of power, maintenance of roadway, structure and rolling stock.
Engineering Activities in the War Zone.
Difficulties of Securing Materials—
(a) From the manufacturer's standpoint.
(b) From the purchasing agent's standpoint.
Engineering War Activities in the United States.

T. & T. ASSOCIATION SUBJECTS

President's Address.
Opportunities for Young Men in Electric Railway Work.
Maintenance of a Transportation Force During the War, with Special Reference to Women Conductors.
The Skip Stop—Spreading the Peak Load—Economies in Using Power.
Electric Railway Transportation in Great Britain as Affected by the War.

ENTERTAINMENT PROGRAM

The entertainments will be of a simpler character than heretofore, to accord with war conditions, but will be such as to keep the delegates busy during their hours "off duty." The principal feature will be a reception and dance on Oct. 9.

E. F. Wickwire, chairman of the 1916 entertainment committee, is in charge this year. The following have been selected to serve with Mr. Wickwire: J. J. Dempsey, vice-president of Brooklyn Rapid Transit System, Brooklyn, N. Y.; E. R. Kelsey, publicity manager of the Toledo Railways & Light Company, Toledo, Ohio; Frank Gale, advertising manager of the General Electric Company, Schenectady, N. Y.; J. C. McQuiston, manager of the publicity department of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Strike in Atlantic City

The employees of the Atlantic City & Seashore Railroad, Atlantic City, N. J., went on strike on May 23 following the refusal of the company to grant their demands for increased pay and better working conditions.

Last summer the company announced that owing to the increased cost of operation it could not grant any wage increases. Since that time there had been repeated agitation for changed conditions and better pay. The company refused to recognize the union, but has increased wages. When the company learned that the situation was acute it began importing men so the early summer rush could be handled without much interference. The motormen and conductors than met and sent an ultimatum to the company.

Toledo Injunction Argued

Railway History of Ohio City Reviewed in Injunction Case Growing Out of Wage Advance

At a hearing during the week ended May 25, on the temporary injunction granted the Toledo Railways & Light Company against the city of Toledo, Henry L. Doherty, chairman of the board of the company, reviewed the history of the Toledo Street Railway Commission and its work in preparing the community plan of operation. Mr. Doherty was a member of the commission in the first place, but he eliminated himself or was eliminated, whichever people chose to consider it. Mr. Doherty said his publicity campaign when the Dotson franchise was proposed did not produce the results that were anticipated.

In regard to the community plan, he said Member Thurston put a number of unworkable ideas into it, but that the break came in the proposed manner of handling stock sold to the public. He denied that any of the meetings of the commission had ever been held outside of Toledo.

MR. WITT A WITNESS FOR COMPANY

Peter Witt, Cleveland, testified for the company. He suggested that the income might be increased by speeding up the cars, rerouting cars about the loops, keeping wagons off the tracks on the streets and making as few stops as possible. He urged that a campaign be conducted by the company to make car riding more popular.

F. C. Hamilton, electric railway engineer, New York, presented figures to show that the new rate of fare, 5 cents with 1 cent for transfers, will pay only the increase in wages allowed recently by the company to the conductors and motormen. He said there would be nothing left to increase the dividends of the company.

MAYOR SCHREIBER GRILLED

Mayor Cornell Schreiber testified that he had done nothing that would cause people to think he intended to interfere with the operation of the cars. On the other hand, he had declared that the cars must not stop as the result of a strike or for any other cause. Attorneys took him back to campaigns for office some years ago when he is said to have advised people not to pay more than 3 cents for a ride. He was not a very willing witness on this point.

The injunction was granted to prevent the city from interfering with an increase in fares in Toledo to meet increased wages which had been agreed upon by the company and its employees.

Detroit and Cleveland Wages Under Advisement

War Labor Board in Chicago Hears Contentions of Companies and Men in Michigan and Ohio Cities

After a five-hour session in Chicago, Ill., on May 27, the United States War Labor Board took under advisement the disputes between the employees and the managements of the Detroit (Mich.) United Railway and the Cleveland (Ohio) Railway as to wages and working conditions. William Howard Taft and Frank P. Walsh, co-chairmen, as well as the full membership of the board, were present. There were also present F. W. Brooks, president of the Detroit United Railway, and John J. Stanley, president of the Cleveland Railway, and other officials of the Detroit and Cleveland companies, as well as representatives of the unions and municipal governments in both cities. The case for the employees was presented by Attorney James H. Vahey and International President W. D. Mahon, while Attorney Bernard J. Weadock presented the Detroit company case and Attorneys H. J. Crawford and Andrew Squires told of the Cleveland company situation.

Decision Probably a Precedent

Chairman Taft announced that an examiner would be appointed to check up the evidence and the exhibits, after which the full board will make a ruling for the purpose of bringing about an amicable settlement. Following the hearing, Chairman Walsh said the employees would receive a fair wage, no matter what readjustments or additional legislation might be required to accomplish this result. The decision of the board in this joint case is expected to set a precedent for other wage disputes affecting electric railways.

There was a dispute between the attorneys at the opening of the case because Mr. Vahey presented, on behalf of the men, demands which were more extreme than those covered in a written demands previously presented to the Detroit company. The board held, however, that the inquiry was "wide open," the purpose being to determine what the men are really entitled to. In brief, the conductors and motormen in both cities ask for straight pay of 60 cents an hour and that 40 per cent of the runs be covered in eleven consecutive hours; 40 per cent in twelve and 20 per cent in thirteen consecutive hours. They also ask that all Sunday and holiday runs be straight time not exceeding eight hours and that the night cars be straight eight-hour runs with ten hours' pay; also for Detroit the men ask time and a half for overtime, which is allowed in Cleveland.

The Detroit men also ask that car inspectors, controller men and pit men be included in the trainmen's agreement. The board made an important ruling on this point to the effect that these men could organize and join the union, but the company would not be compelled to recognize them or to have a closed shop for such employees. The chairman also held that under the principles established by the board, there could be no discrimination as to sex or color, and if the necessity arose, the company should not be prohibited from employing negroes as motormen or women as conductors.

Complaint Against Spread of Hours

Attorney Vahey complained that the conditions in Detroit and Cleveland as to spread of hours, reaching in some cases more than fifteen hours, was intolerable, and that this should be corrected either by reducing the spread of hours or fixing a penalty where the schedules are made on that basis. In this connection, Chairman Taft wanted further information on the Massachusetts nine-in-eleven-hour law and the Ohio statute, which requires eight hours of rest between two working days. He wanted to know what attracted men to the electric railway business and was told that steady employment was one of the features.

Attorney Vahey dwelt at length on the difficulties and responsibilities of the trainmen's work, which he classed as skilled labor. In referring to wages, he introduced exhibits showing schedules of higher pay in other trades in Detroit and Cleveland, and he contended that the right of the men to a proper standard of living should not be controlled by the lack of financial ability on the part of the companies. He informed the board that the average pay of trainmen was about $90 a month in these cities and he pointed to the recent award for steam railroad employees, giving large increases in wages. Mr. Mahon said that the association was not insisting on an eight-hour day during war times as it realized unusual conditions existed.

Employees Surprise Company

Attorney Weadock, for the Detroit company, said the new demands presented on behalf of the men had found the companies unprepared to reply, and he asked time to file additional exhibits later on. He explained conditions in Detroit, where he said about 50 per cent of the industries are engaged in war work, resulting in high wages which the company has found it impossible to meet. He told of the situation as to employment of negroes and the refusal of the union to grant them work cards. He also said the union objected to the employment of women as conductors, and that a fine was provided for a motorman who in an emergency might choose to work as a conductor on a trailer. The revised demands of the union, he said, would mean an increase of $5,750,000 in wages —an increase of 110 per cent—and the employment of 1566 additional trainmen. He contended that the work of a conductor or motorman did not constitute skilled labor, and in support of this he quoted from Bulletin 204 of the United States Bureau of Labor Statistics, which classes these occupations as calling for "responsibility rather than skill."

Mr. Weadock also made the point that the Detroit fares were the lowest in the United States and up to a recent date the wages for trainmen were the highest in any city east of the Rocky Mountains. He said that while the recent award to steam railroad employees granted a large increase in pay, this was promptly met by an advance in freight and passenger rates. The electric railways were not in a position to meet expenses in this way. He made a strong point of an exhibit showing that the majority of trainmen in Detroit did not seize an opportunity to earn the maximum amount of wages, and contended that it was not likely they would do so.

Assistant Superintendent Ives filed a number of exhibits on schedules

Company Needs Larger Revenue

Mr. Weadock made a point of the financial situation of the Detroit company, saying that in spite of an advance in rates of fare last year, there was a deficit in the net revenue. He expressed the hope that the War Labor Board would make some recommendations that would result in larger revenues for the company, with which to meet increased costs. Chairman Taft explained that the board was not conscious of having any power to do this, but the members would consider the situation. The corporation counsel of Detroit said the city was interested primarily in service, and that he also hoped the board would point the way to meet any increased costs which might be fixed by its award.

Attorney Crawford told of the peculiar situation in Cleveland under the Tayler ordinance. He pointed out that the maximum rate of fare allowed under the ordinance was now in force, but even with this new revenue it was estimated that there would be a deficit of $925,000 in the current year, even without increasing the trainmen's wages. These new demands would mean an added burden of $2,500,000. Attorney Squires emphasized these points and said the moral influence of the War Labor Board would be helpful in pointing the way to secure new revenue. The company did not like to reduce the service, even though this was permitted under the provisions of the ordinance.

Fielder Sanders, City Commissioner of Cleveland, said the city and the company were co-operating and every possible step had been taken to reduce expenses and increase revenues. The only possible remedy which he had in mind was a provision for staggered hours for factory and store closing, which would cut the peak in half. He referred to the experience of Washington and Rochester along these lines and he thought the recommendations of the board would pave the way for its adoption in Cleveland.

Boston Stockholders to Act on June 3

The directors of the Boston (Mass.) Elevated Railway on May 24 called a meeting of stockholders to be held on June 3 to take such action as the stockholders deem advisable with reference to the acceptance of the act to provide for the public operation of the Boston Elevated Railway, and also to pass upon the matter of authorizing the issue of $3,000,000, par value, of preferred stock for the purposes specified in the act.

Chicago Freight Ordinance Not Yet Drafted

About two months ago the State Council of National Defense requested the City Council of Chicago, Ill., to take under consideration the matter of passing an ordinance which would permit the transportation of freight and express over the elevated and surface lines. This would make possible the delivery, receipt and interchange of freight by and between the various electric interurban lines which radiate from Chicago, but are now obliged to maintain their terminals from 6 to 8 miles from the heart of the city.

The matter was referred to the committee on local transportation, who in turn referred it to a sub-committee with H. B. Capitain as chairman. This committee is now drafting an ordinance which will permit the handling of freight and express, but will restrict this to certain classes. Considerable difficulty is being experienced in framing an ordinance which will permit the handling of such materials as will directly benefit the community and yet not permit undesirable freight to be handled.

The committee is at present very busy trying to work out other ordinances in connection with the surface and elevated lines, but reports that the freight ordinance may be put through before the end of the summer vacation.

Organizing to Insure Clean Coal

To guard against the waste and serious loss resulting last winter from the shipments of dirty coal, which occupied car space and also seriously decreased industrial plant efficiencies, the Fuel Administration has organized a division of inspection, with C. M. Means as manager. A chief inspector has been appointed in each of twenty-one representative districts and where necessary assistant inspectors will be added. These inspectors will examine coal in the mines, also as dumped from mine to tipple, watch the picking tables and again inspect the coal as it is loaded in cars for shipment.

Standards will be established for insuring proper preparation according to use, so that all coal shipped must be of the quality required for its particular purpose. By condemning coal at the mine, a great improvement in the transportation situation should result in that the railroads will in effect be hauling heat units, not ash. Miners who get out dirty coal will be penalized, and a bonus system is being developed. Mines that cannot supply properly prepared coal will not be allowed to ship by rail.

Wage Increase in San Diego

The following scale of wages for motormen and conductors of the San Diego (Cal.) Electric Railway will be in effect commencing June 12. First year, 32 cents an hour; second year, 34 cents an hour; third year, 35 cents an hour; fifth year and thereafter 38 cents an hour.

One-man car operators are allowed 3 cents an hour in addition to the regular rate of pay.

The new scale represents an average increase of 10 per cent over the scale which went into effect on Aug. 15, 1917, and, in addition, increases the rate of bonus for operators of one-man cars to 3 cents an hour instead of 2 cents.

When Vice-President and Managing Director W. Clayton became connected with the company in San Diego the platform men received 20 cents an hour. This was in 1901. From that date the men have never asked for an increase; but six times since that time voluntary increases have been authorized, usually coming to the men, as in the case of the last announcement, as a clear-cut surprise. The increases were allowed in October, 1906; January, 1910; January, 1912; January, 1914, August, 1917, and June, 1918.

Portland Jitneys Win

At a special city election in Portland, Ore., on May 17, the people voted about two to one for the return of the jitneys. This result is attributed to the vicious campaign of misrepresentation and the widespread sentiment against the 6-cent fare in effect on the lines of the Portland Railway, Light & Power Company.

Two regulatory measures were before the voters on May 17. One was known as the "Jitney Bonding Ordinance" and was placed on the official ballot by action of the City Council. It provided that the bond of $2,500, which has been in effect, should be reduced to $1,000 for one or a few jitneys, with a single $10,000 bond for any number more than a few. This ordinance did not provide for any regulation of jitneys as to service, routes, schedules, transfers, etc.

The other bill was entirely a jitney service measure. It was known by that name and was placed on the official ballot through the initiative of the employees of the Portland Railway, Light & Power Company. The purpose in this case was that if the jitneys did come back they would be required to give reasonable, regular and dependable service.

The Portland Railway, Light & Power Company has reprinted in pamphlet form a series of fifteen advertisements published in the daily newspapers, relating to the 6-cent fare case and the two jitney measures.

Reading Employees Strike

A considerable number of trainmen in the employ of the Reading Transit & Light Company, Reading, Pa., went on strike on May 22 following the refusal of the company to meet a demand for an increase in wages of 6 cents an hour. A statement of the company follows:

"Eight employees of the Reading Transit Company were dismissed from the service of the company on May 23 when it was learned that they were implicated in a movement started by an out-of-town organizer which might have resulted in crippling the car service.

"All of the men employed by the company were recently granted an increase of 1 cent an hour in wages to go into effect on June 1, when their rate of pay will be from 28 to 31 cents an hour, depending upon a length of service of from one to three years.

"To all appearances the men were satisfied with this advance until the advent of an out-of-town agitator, who is said to have come to Norristown to look into labor troubles in other industries. The railway men had never made any demands upon the company for wages, neither had the men come to the company with any other complaint or grievance. When the company learned of the new method being employed to create dissension among the men it was deemed best for the preservation of service to the public to dispense with the service of those dissatisfied. The men also were told that the company was willing and eager to meet its employees about any matter they decided to take up, and that it was unnecessary for them to have the services of an outsider to look after their interests. The discharged employees were told that if it could be shown that the company had made a mistake in their dismissal the matter of their reinstatement would be promptly taken up."

News Notes

Increase in Wages in Tampa.—The Tampa (Fla.) Electric Railway has recently increased the pay of all trainmen and all carhouse, track and other employees not on a monthly salary basis 2 cents an hour.

Men Reject Wage Offer.—The employees of the Worcester (Mass.) Consolidated Street Railway have voted to reject the offer of a wage increase as made to them by the company. They consider the offer of the company inadequate in view of the present economic conditions.

Increase in Wages in Sacramento.—An increase of 3 to 5 cents an hour in the pay of 175 motormen and conductors employed on the local railway lines

operated by the Pacific Gas & Electric Company, Sacramento, Cal., was announced on May 17 by representatives of the company. It was to become effective immediately.

Winnipeg Paralyzed by Strike.—Union headquarters at Winnipeg, Man., on May 21 called the 15,000 union men to strike in the morning in sympathy with the city employees now on strike. This, added to the 12,000 already out, paralyzes the city's trade. The cars of the Winnipeg Electric Railway stopped on May 21 for the duration of the strike. The city firemen are all out.

Increase in Pay for Oakland Men.—The San Francisco-Oakland Terminal Railways, Oakland, Cal., has increased the pay of the conductors and motormen. For the first six months the employees will receive 33 cents an hour instead of 30 cents, for the second six months 35 cents instead of 32, and for the third six months 36 cents instead of 34 cents as at present. No increase will be granted for the fourth six months or thereafter.

Ninth Chicago Traction Report Out.—The ninth annual report of the Board of Supervising Engineers, Chicago Traction, has just been issued. This covers the year ended Jan. 31, 1916. It contains the financial exhibits of that year for the Chicago Surface Lines, and also a reprint of the document previously issued in reference to an investigation of traffic conditions and electric railway service in Chicago. This was abstracted in the ELECTRIC RAILWAY JOURNAL of July 29, 1916; Aug. 5, 1916, and Aug. 12, 1916. The issuance of the eighth report of the board was noted in the issue of Jan. 19.

Will Meet Commission Order.—S. B. Way, vice-president and general manager of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has announced that the company will not oppose or appeal from the recent decision of the Wisconsin State Industrial Commission fixing the conditions under which women may be employed on electric railway cars in that State. Mr. Way is reported to have said that the company had its day in court during the hearing before the commission, which decided against it. The general terms of the commission ruling in this case were noted recently in the ELECTRIC RAILWAY JOURNAL.

Resumption of Franchise Resettlement Sessions.—It is understood that the three committees from Oakland, Berkeley and Alameda, appointed to consider the resettlement franchises for the San Francisco-Oakland Terminal Railways, formed themselves into a joint committee of nineteen and have had many meetings. It is said that the labors of this joint committee are about at an end and that at a very near date a perfected resettlement franchise will be reported to the Councils of the three cities for appropriate action in accordance with the provisions of the three charters, which provisions were favorably passed upon by the voters at elections.

Wage Award Accepted.—A new wage scale, drawn up by a board of arbitration, was accepted on May 16 as satisfactory by men and the Steubenville, East Liverpool & Beaver Valley Traction Company. Under the new contract, which is for one year, beginning May 1, 1918, the first-year conductors and motormen in passenger service will receive 38 cents an hour; second-year men, 40 and 42 cents an hour, and third-year men and thereafter, 45 cents. Conductors and motormen for freight service will receive 50 cents an hour. Under the old scale the men received 30 cents an hour for first and second year service and 32 cents an hour for service after the second year.

Details of Charlotte Wage Advance.—The new schedule of pay for motormen and conductors of the Southern Public Utilities Company, Charlotte, N. C., effective from May 1 and to which brief reference was made in the ELECTRIC RAILWAY JOURNAL of May 25, page 1024, is as follows: First three months, 18 cents; war bonus, 2 cents. Second three months, 19 cents; war bonus, 2 cents. Second six months, 20 cents; war bonus, 3 cents. Second year, 21 cents; war bonus, 3 cents. Third year, 22 cents; war bonus, 3 cents. Fourth year, 23 cents; war bonus, 4 cents. Fifth year, 25 cents; war bonus, 5 cents. The increases are made to aid the men in meeting the increased cost of living.

Women Employees Strike.—Women conductors on the cars of the Wisconsin Gas & Electric Company in Kenosha, Wis., went on strike on May 22 in what is believed to be the first strike of its kind in this country in which women employees have participated. The women followed the lead of men who walked out when their demand for an increase of 10 per cent in their wages was refused. The company recognized the changed economic conditions but said an increase could not be made if the company was to meet operating expenses. May 24 the company paid off the twenty-four conductorettes and sixteen motormen in full and they turned in company property in their possession. Up to May 27 service had not been resumed.

Labor Unrest at Scranton.—The trainmen in the employ of the Scranton (Pa.) Railway went on strike on May 25. The men say they will not return unless they are paid 40 cents an hour. On May 27 conductors, motormen and track laborers of the Lackawanna & Wyoming Valley Railroad, operating between Scranton and Wilkes-Barre, issued an ultimatum to the company that unless the men receive an increase of wages of 30 per cent they will go on strike. The company has offered the men 10 per cent. Employees of the Northern Electric Street Railway, operated under lease by the Scranton & Binghamton Traction Company, have made demands upon the management for a wage adjustment. It was expected in this case that a conference would be held on May 28.

Appeal to City on Wage Request.—Surface and elevated railway employees appealed to the City Council of Chicago, Ill., on May 20 to approve of their demands for higher wages. The Council concurred in a belief that the men are entitled to more pay, but took no other action except to refer the matter to the committee on local transportation. Alderman H. D. Capitain, chairman of the local transportation committee, asked the Council to "go slow" on the wage question. He said the traction ordinances now before that body do not provide for the city having any voice on it. Alderman Thomas F. Byrne insisted that the Council go on record as favoring an increase for the car men. The Council did this unanimously. Details of the proposed wage scales were reviewed in the issue of the ELECTRIC RAILWAY JOURNAL for May 25, page 1022.

Programs of Meetings

National Safety Council

The annual congress and safety exhibition of the National Safety Council will be held at the Hotel Statler, St. Louis, Mo., Oct. 14 to 16. Several sectional programs are now complete. It is expected that many innovations will be introduced this year. W. H. Cameron, Continental & Commercial Bank Building, Chicago, Ill., is general manager of the council.

Pennsylvania Street Railway Association

The annual meeting of the Pennsylvania Street Railway Association will be held at the Hotel Adelphia, Philadelphia, Pa., on June 7 at 2 p.m.

By reason of the exigencies of the war and the abnormal conditions created thereby this will be a short session; nevertheless there are some questions of vital interest to the railway and the affiliated organizations which will be up for discussion and it is the purpose to outline policies of action in regard to them.

The usual dinner will be served at 7 p.m.

New York Electric Railway Association

The thirty-sixth annual meeting of the New York Electric Railway Association will be held at Hotel Champlain, Bluff Point, N. Y., on June 22. The association is to deviate somewhat this year from the plan of its program in previous years. There will be no discussion of technical papers. Instead there will be a general discussion of the financial conditions of the properties, etc., by the representatives of the railways, banking interests and manufacturers. William Howard Taft, Ex-President of the United States, and William H. Edwards, Collector of Internal Revenue, Second District, New York, are to be the speakers at the supper which will take the place of the annual banquet.

Financial and Corporate

D. & H. Lines Burdened

Electrics in 1917 Showed Decreased Operating Income—United Traction Deficit $95,000

The adverse conditions which prevailed in the preceding three years not only continued during 1917 for the allied electric lines of the Delaware & Hudson Railroad, but were greatly augmented by the increased cost of labor and supplies. According to the 1917 annual report of the parent company, the results of the electric railway subsidiaries in the last year were as follows:

United Traction Net Operating Income $209,536

The operating revenues of the United Traction Company, Albany, N. Y., for the calendar year 1917 amounted to $2,458,848, the operating expenses to $2,055,196, and the net operating income to $209,536. These data show an increase in operating receipts of $14,791 over 1916 and $94,136 over 1915, but the figures are still $40,502 below the gross of 1914 and $87,774 below 1913. The operating expenses of 1917 increased $83,524 over 1916; $110,935 over 1915; $297,027 over 1914, and $451,135 over 1913. The net operating income was $70,414 less than in 1916; $5,997 less than in 1915; $312,081 less than in 1914, and $529,815 less than in 1913. The net deficit for the year, after paying fixed charges, was $95,356.

The operating revenue of the Hudson Valley Railway, Glens Falls, was $703,073, the operating expenses $503,562 and the operating income $157,334. In comparison with 1916 the operating revenue increased $29,075; this was an increase over 1915 of $90,030, and over 1914 of $39,709. Operating expenses increased $31,439 over 1916; $29,011 over 1915, and $40,046 over 1914. Net operating income was $3,721 less than 1916, but exceeded 1915 by $59,883, and was less than 1914 by $2,882. The net deficit from railway operations for the year was $30,137 greater than in 1916 but was less than in 1915 by $54,106.

The operating revenues of the Plattsburgh (N. Y.) Traction Company were $38,878; the operating expenses, $28,417, and the operating income, $9,021. The gross receipts of 1917 were in excess of those of 1916 by $994, 1915 by $7,682 and 1914 by $5,706. Operating expenses exceeded 1916 by $4,276, 1915 by $6,983 and 1914 by $6,738. Net operating income decreased $3,361 below 1916, exceeded 1915 by $450, and was less than 1914 by $1,378. The net income for the year decreased $3,207 below 1916, but exceeded 1915 by $816, and was less than 1914 by $1,241.

Troy & New England Operating Income $9,107

The operating revenues of the Troy & New England Railway, Troy, N. Y., amounted to $29,824; the operating expenses, $19,315; the operating income, $9,107. The gross receipts decreased $4,435 under 1916; $2,764 under 1915, and $5,333 under 1914. Operating expenses decreased $4,279 as compared with 1916, and $5,054 as compared with 1915, but exceeded 1914 by $367. Net operating income decreased $131, but exceeded 1915 by $2,143, and was less than 1914 by $5,775. The net deficit of the year increased $521, but was less than 1915 by $1,669, and in excess of 1914 by $6,190.

Electric Railway Statistics

Returns From 7501 Miles of Line for February Show Net Income Fell Off 12.71 Per Cent

A comparision of electric railway statistics for February, 1918, and the corresponding month of 1917, made by the information bureau of the American Electric Railway Association, indicates that the net earnings and operating income of electric railways is still badly affected, in the East.

Data for February, representing 7501 miles of railway, figured on the per mile of line basis, show an increas in operating revenues of 3.17 per cent, an increase in operating expenses of 11.02 per cent and a decrease in net earnings of 12.71 per cent. Data representing approximately 75 per cent of this mileage indicate a decrease in operating income of 19.84 per cent, an improvement over the previous month.

The returns from the city and interurban electric railways, as shown in detail in the accompanying table, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

The three groups all show a considerable increase in operating expenses, particularly the Eastern. On the other hand, the largest increase in revenue, one of but 6.27 per cent, occurred in the Southern district. This district as a whole makes the best showing, though its returns are far from being satisfactory. Returns for the Eastern group indicate a slight increase in revenues and a decrease in net of 37.78 per cent.

The operating ratio of all groups has increased, particularly that of the Eastern district, which increased from 68.09 per cent in 1917 to 74.48 per cent in 1918. The operating ratio for the country as a whole has gone from 66.91 to 72 per cent.

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR FEBRUARY, 1918 AND 1917

Account	United States				Eastern District				Southern District				Western District			
	Amount, February, 1918	Per Mile of Line			Amount, February, 1918	Per Mile of Line			Amount, February, 1918	Per Mile of Line			Amount, February, 1918	Per Mile of Line		
		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917
Operating revenues	12,699,574	$1,693	$1,641	3 17	$8,129,041	$1,595	$1,551	2 84	$1,192,267	$1,390	$1,308	6 27	$3,378,266	$2,188	$2,113	3 55
Operating expenses	9,141,853	1,219	1,098	11 02	6,058,559	1,188	1,056	12 50	715,819	834	761	9 59	2,367,475	1,533	1,409	8 80
Net earnings	3,557,721	474	543	†12 71	2,070,482	407	495	†37 78	476,448	556	547	1 65	1,010,791	655	704	†6 96
Operating ratio, per cent	1918, 72 00; 1917, 66 91				1918, 74.48; 1917, 68.09				1918, 60 00; 1917, 58 18				1918, 70.06; 1917, 66 68			
Average number of miles of line represented	1918, 7,501; 1917, 7,391				1918, 5,098; 1917, 5,055				1918, 858; 1917, 803				1918, 1,544; 1917, 1,534			

COMPANIES REPORTING TAXES

Operating revenues	$8,833,208	$1,615	$1,576	2 47	$5,210,443	$1,405	$1,369	2 63	$599,570	$1,588	$1,466	8 32	$3,023,195	$2,181	$2,157	1 11
Operating expenses	6,601,983	1,207	1,096	10 13	4,111,167	1,109	994	11 57	356,083	943	807	16 85	2,134,733	1,540	1,445	6 57
Net earnings	2,231,225	408	480	†15 00	1,099,276	296	375	†21 07	243,487	645	659	†2 12	888,462	641	712	†9 97
Taxes	619,551	113	112	0 89	376,611	102	100	2 00	50,896	135	127	6 30	192,044	139	142	†2 11
Operating income	1,611,674	295	368	†19 84	722,665	194	275	†29 45	192,591	510	532	†4.14	696,418	502	570	†11 93
Operating ratio, per cent	1918, 74.74; 1917, 69 54				1918, 78 93; 1917, 72 61				1918, 59.38; 1917, 55.05				1918, 70.61; 1917, 66 99			
Average number of miles of line represented	1918, 5,471; 1917, 5,414				1918, 3,708; 1917, 3,666				1918, 378; 1917, 372				1918, 1,386; 1917, 1,377			

† Decrease

No Power Over Depreciation Rate

Highest New York Court Annuls 20 per Cent Maintenance and Depreciation Order of First District Commission—Authority Not Granted by Statute

The Public Service Commission for the First District of New York has no authority to require an electric railway to reserve a definite percentage of its revenues for maintenance and depreciation. This is the final outcome of a legal battle which has been waging since such an order was promulgated in February, 1912, in connection with the reorganization of the old Metropolitan Street Railway in New York City.

The successor company, the New York Railways, was required, before paying any interest on its income bonds or dividends on its stock, to set aside each month 20 per cent of its gross operating revenue for maintenance and depreciation and, if this was not expended during the month, to credit the unexpended amount to an account called "Accrued Amortization of Capital."

The company objected to the order on the grounds that the commission was without power to make it; that the required reservation was not always needed in full for the purposes designated and that the directors were the proper persons to determine the depreciation rate and amount of reserve. On Jan. 18, 1918, the Appellate Division of the Supreme Court in certiorari proceedings affirmed the order, with the finding that the regulatory law had conferred full power upon the commission to regulate the methods of public service corporations.

Appellate Division Overruled

The decision of the lower court, however, was reversed on May 14 by the highest court in the State, the Court of Appeals. The opinion of this court states that the commission bases its authority to make the order upon Section 52 of the public service commission act, which provides for the establishment of a system of accounts. In regard to this the court, with the unanimous approval of the six judges sitting on the case, says:

"Section 52 was plainly intended to make the method of accounting by these corporations uniform so that the accounts could be readily comprehended by those required to examine the same. By establishing a system of accounts the corporations were required to show under particular heads what they had done. It was not to regulate the management of their finances but to show what the management was.

"The other sections of the act clearly do not in express terms authorize the commission to require the creation of a reserve fund to renew the plant when the same shall be worn out or shall become obsolete. It is not pretended by anyone that they do.

"The power of the Public Service Commission is extensive, and the act creating the commission should be construed in the same spirit in which it was enacted. Still, when a particular power is exercised by the commission or is claimed for it, that power should have its basis in the language of the statute or should be necessarily implied therefrom. The assertion of authority under review here is outside and beyond the statute.

"The decision in Quinby vs. Public Service Commission (223 N. Y. 244) is controlling here and requires us to hold that the Public Service Commission had no authority to make the order requiring the company to reserve 20 per cent of its gross operating revenue for maintenance and depreciation and for the creation of the amortization of capital account."

More Than $3,000,000 Accumulated

As of June 30, 1917, the account for "Accrued Amortization of Capital" amounted to $3,127,258, equivalent to more than 10 per cent on the outstanding adjustment income 5 per cent bonds. Although interest on these bonds is non-cumulative, the bondholders assert that the fund should be distributed among them. No interest payment on these securities has been made since 1916.

Accounting Conference

Railway Men Object to Any Definite Depreciation Percentages in New Tentative Classification

The Public Service Commission for the Second District of New York on May 22 discussed with representatives of various electric railway corporations from all parts of the State a proposed new accounting classification for electric railway lines. The conference was called for the purpose of ascertaining the views of corporation accounting officials as to differences between the proposed system and the classification now in force. The new tentative classification was briefly described in the ELECTRIC RAILWAY JOURNAL of Feb. 2, page 228.

No serious objections were made to the classification as a whole, but the requirement that definite percentages of property costs should be set aside in a depreciation reserve was opposed. The electric railway representatives took the ground that the amount to be set aside to provide for retirements and the method of determining it were matters for the directors of the corporations to decide and not the commission.

M. S. Decker of Albany, representing those present at the hearing, objected to the requirement that a depreciation reserve be created and maintained by charges to operating expenses for depreciation equal to a fixed percentage of the cost or book value of depreciable property, based upon the probable life in service of the different classes of property. Mr. Decker said that unless peculiar conditions were shown, 2 per cent upon the average total cost would be regarded under the new classification as the minimum percentage to represent depreciation accruals, with 5 per cent as the maximum for way and structures and 10 per cent for equipment. He explained that the Court of Appeals, in the recent case of the New York Railways vs. the Public Service Commission for the First District (abstracted in another column), has held that the public service commission law does not confer power upon the commission to order the use of definite depreciation rates.

Chairman Hill said that the commission would consider the decision of the Court of Appeals and various suggestions which were made, and that changes would be formulated as the result of the hearing. Another conference will then be called.

Northern States Railway Earnings Drop

The gross earnings of the Northern States Power Company, Chicago, Ill., for the year ended Dec. 31, 1917, amounted to $7,154,508, an increase of $1,067,355 over the preceding year. The operating expenses showed heavy increases, but the year was closed without any loss in net earnings as compared to 1916. In view of the customary allowances for depreciation and amortization, aggregating $575,000, it was necessary to draw on the accumulated surplus for $240,970 of the common stock dividends.

The gross earnings from electric railway operation in the four communities served by this company were $89,976, or 1.26 per cent of the total gross in 1917, as compared to $102,067 or 1.68 per cent in 1916. The railway gross, both as to amount and as to percentage, was the smallest since 1911, inclusive. The railway net earnings in 1917 amounted to $8,429 or 0.25 per cent of the total net, as compared to $25,075 or 0.75 per cent in 1916. The contrast in the net results between 1917 and the years preceding 1916 can be sufficiently judged from the fact that 1916 was the poorest year since 1911.

On March 25, 1918, the total sales of preferred stock to patrons of the company amounted to 5425, aggregating $2,774,000 par value of stock. Since Jan. 1 the number of new shareholders each month and the volume of preferred stock sold have greatly exceeded the results of any preceding period. The average number of shares is seven.

Latest Report in New York

The eleventh annual report of the Public Service Commission, Second District of New York, which has just been issued in bound form, contains some electric railway financial data, which with allowances for changes in the fiscal year and other comparative points, indicate the existence of certain suggestive tendencies. The revenues and the expenses both increased somewhat in the calendar year 1916 as compared with the year ended June 30, 1916. The railway

operating revenues at $34,086,000 represented an increase of 4.3 per cent as compared to those for the fiscal year ended June 30, 1916, while the railway operating expenses at $22,364,000 were an increase of 4.9 per cent. The railway tax accruals amounted to $2,105,000, an increase of 5.6 per cent, and although interest charges decreased 1.1 per cent, other deductions from gross income increased 6.7 per cent. The result in 1916 was net income of $1,882,000, an increase of 13.4 per cent over that of the year ended June 30, 1916, but a decrease of 36.5 per cent from the results in the year ended June 30, 1907, the first year of the series recorded. The dividends at $3,123,000 were larger than net income.

The total of fares and transfers recorded (669,895,000) was greater in the year ended Dec. 31, 1916, than in any previous year, but the total revenue car mileage (105,847,000) was slightly less than for the year ended June 30, 1914, which was the highest year of the series. The operating ratio for the calendar year 1916, at 65.76 per cent, was the highest since 1909.

Direct Aid for St. Louis

War Finance Corporation Loans $3,235,000 for Six Months—Brooklyn and Tennessee Lines Ask Help

The War Finance Corporation on May 28 announced the approval of a direct loan to the United Railways, St. Louis, Mo., subject to the approval by counsel of the legality of the issue and all proceedings, of $3,235,000 for six months from June 1, 1918, at a 7 per cent rate. The loan is secured by the entire issue of first and underlying mortgage bonds of the Union Depot Railroad, plus $800,000 in Liberty Bonds.

This company has already secured from the Public Service Commission of Missouri the right to establish a 6-cent fare, which will become effective on June 1. Conditions surrounding the application were such, in the opinion of the directors of the corporation, as to bring it within the provisions of the act covering advances in exceptional cases.

A conference was held in Washington on May 28 between T. S. Williams, president Brooklyn (N. Y.) Rapid Transit Company, and the War Finance Corporation in regard to a grant of funds to meet the $57,735,000 of notes maturing on July 1. The decision of the corporation has not been announced.

The Tennessee Railway, Light & Power Company, Chattanooga, Tenn., recently made application to the War Finance Corporation at Washington for a loan to provide for the payment of $2,500,000 of 5 per cent gold coupon notes of the company which matured on June 1. Inasmuch as it was not certain the company could secure action in time to provide for the payment of the notes at maturity, the holders were requested not to present the notes for payment until the decision of the War Finance Corporation is reached.

Warning About Direct Federal Financing

Government Seeks to Remove General Misconception—Except in Unusual Cases, Utility Financing Must Be Done Through Companies or Banks

The War Finance Corporation has already found the heaviest end of its business to be the consideration of applications for direct loans. The pressure for such loans has become so great that the directors have deemed it necessary to issue a statement to the effect that the financing of utilities and other war industries should be handled by the companies themselves or through the banks. The government will directly finance local utilities only in exceptional circumstances, making such a step a matter of national importance.

No General Direct Financing

The statement, which was issued on May 28 and should be read in connection with one of May 24 appearing on page 1041 of this issue, follows in part:

"The resources of the War Finance Corporation are not intended to be loaned directly to war industries, unless in an exceptional case, but only indirectly through the banks.

"In the progress of the bill through Congress advances under the exceptional cases clause were further restricted as to security and amount—thus indicating the intention of Congress that the borrower must show some exceptional circumstances clearly entitling him to relief. In no circumstances was it the intention that the corporation should make loans except upon adequate security.

"The corporation was organized as an instrumentality to which the banks of the country could resort to obtain accommodation on advances made by them to war industries upon a character of security not available for rediscount at a Federal Reserve Bank. It is hoped that as need arises the banks of the country will avail themselves of the facilities thus afforded, so that they may be amply able to extend credit to those industries of the country which are necessary or contributory to the prosecution of the war.

A Word to the Utilities

"From the applications received by the War Finance Corporation there seems to be an impression in certain quarters that the corporation was specially designed to provide funds for meeting maturing obligations, particularly those of public utility companies. The law expressly provides that the corporation shall not make direct advances to provide funds to meet such maturing obligations, except possibly in some rare case which could clearly be brought within the exceptional cases clause. Of course, the corporation will stand ready to lend its assistance to banks and bankers in proper cases where they have themselves made advances in war industries, whether for the purpose of meeting maturing obligations or otherwise, and direct advances in deserving cases that come clearly within the provisions of the law.

"Holders of maturing obligations, whether of public utilities or of other concerns which may find themselves unable, because of temporary conditions, to meet their commitments punctually should consider whether, in the public interest as well as their own, they should not co-operate by consenting to reasonable renewals. Public utility companies particularly, in co-operation with the communities in which they operate, should have the opportunity of adjusting themselves to the changed conditions brought about by the war.

"No machinery has been specially provided for direct purchases of obligations of the public utilities, whether to meet maturities or otherwise, either through the War Finance Corporation or through any other governmental agency. The situation of these public utility companies is, therefore, quite different from that of the railroads, where Congress has made specific provision for the purchase of their securities by the government in certain exigencies. Yet even the railroads are expected, wherever possible, to meet their own maturities and to pay what the money is worth to accomplish that end.

Utilities and Railroads Differ

"It must be remembered that the railroads are under federal operation, and that their rates are subject to federal control, and that the government therefore is in a position to see to it that their charges shall be sufficient to meet the cost of the service rendered. In the case of the public utilities, however, neither their operation nor their rates are subject to federal control. Wherever the charges do not amount to adequate compensation for the services rendered, relief can be had only through the appropriate local authorities, and time is essential to enable the companies and the communities in which they operate to reach a satisfactory solution of this important problem.

"It is not a problem which can be disposed of by having the federal government through the War Finance Corporation assume the burden of financing the operations of these local companies, except in exceptional circumstances which may make it a matter of national importance that advances should be made.

"The local authorities will no doubt respond as promptly as possible, in cases where relief is needed because of changed conditions, as it is clear that the soundness and the efficiency of public utilities are intimately connected with a vigorous and successful prosecution of the war."

Three cases pending are referred to elsewhere on this page.

Financial News Notes

Cleveland April Statement Shows Small Surplus.—The operating report of the Cleveland (Ohio) Railway for April was submitted to the board of directors on May 23. It shows a surplus of $3,757. As the maximum rate of fare was in force only twenty days of the month, it is estimated that the surplus for June will probably be around $5,000. This, however, will not be sufficient to take care of the increase in the wages of motormen and conductors which is expected as a result of arbitration.

Tacoma Municipal Railway Results.—H. Roy Harrison, Commissioner of Public Works of Tacoma, Wash., is working out a plan, in co-operation with the Council, for the refunding of the original municipal railway bonds to care for the development which is necessary as a result of the enormous increase in traffic to the tideflats. Tacoma plans to purchase ten more cars for its tideflats line. A statement of C. D. Atkins, retiring Commissioner of Public Works, shows that the city line has been just about breaking even for the last six months.

United Railroads Report Shows Net Loss.—The report of the United Railroads, San Francisco, Cal., for the year ended Dec. 31, 1917, recently filed with the California Railroad Commission, shows that the net loss sustained by the company for the year, after charging off interest, taxes, etc., was $1,566,654. The total operating revenue is shown as $6,355,531, or a decrease of $965,398 from the previous year. Operating expenses are shown to be $5,594,575, or an increase of $788,412 over the previous year. Net revenue from railroad operations is $760,956, a decrease of $1,753,810. Figures for accidents total twenty-three killed and 585 injured.

Deposit of Southern Ohio Bonds Asked.—R. M. Stinson, chairman of a bondholders' protective committee, has addressed a letter to holders of the first consolidated mortgage 5 per cent bonds of the Southern Ohio Traction Company, Hamilton, Ohio, asking them to deposit their holdings with the Cleveland Trust Company, Cleveland, Ohio, or the Girard Trust Company, Philadelphia, for the protection of their rights. The letter states that default has been made in the payment of interest on the bonds due on May 1, 1918.

Partial Abandonment.—The last car on the Bethel line of the Interurban Railway & Terminal Company, Cincinnati, Ohio, ran from Bethel to its terminus at Coney Island recently and the work of tearing up the tracks was then begun. The road was placed in operation in 1902, but it did not pay and on petition of C. M. Leslie and Charles S. Thrasher, receivers of the Interurban Railway & Terminal Company, of which system it is a part, the State Utilities Commission gave permission to discontinue operation of the road and Common Pleas Judge Cushing authorized the receivers to dispose of the equipment.

$2,000,000 of New Milwaukee Electric Notes.—A syndicate composed of Spencer Trask & Company, Harris, Forbes & Company, New York, N. Y., Coffin & Company, Boston., Mass., Wisconsin Trust Company, and the First National Bank, Milwaukee, Wis., has purchased $2,000,000 two-year 7 per cent secured notes of the Milwaukee Electric Railway & Light Company, dated May 1, 1918, and maturing May 1, 1920. A public offering of the notes is now being made at 98½ and interest, yielding 7.80 per cent. The notes are a general obligation of the Milwaukee Electric Railway & Light Company, and are additionally secured by deposit to the trustee of $3,000,000 general and refunding mortgage 5 per cent bonds.

Interborough Dividend Reduced.—The directors of the Interborough Rapid Transit Company, New York, N. Y., on May 28 cut the regular dividend in half, declaring a quarterly dividend of 2½ per cent instead of the previous dividend of 5 per cent, payable on July 1 to stock of record of June 20. That is, the dividend rate is reduced from 20 per cent per annum to 10 per cent per annum. At the same time, "in view of the action taken by the Interborough Rapid Transit Company," it was announced, directors of the Interborough Consolidated Corporation suspended "for the present" the usual quarterly dividend of 1½ per cent upon the preferred stock of that corporation. The statement of the Interborough Rapid Transit Company said that "on account of war conditions and the advisability of conserving the cash resources of the company, the directors deem it inadvisable at the present time to declare the full dividend." In 1910 9 per cent was paid; in 1911, 10¼ per cent; in 1912, 15 per cent; in 1913, 12 per cent; in 1914, 15 per cent; in 1915, 22½ per cent, and last year and the year before, 20 per cent. The Interborough Consolidated Corporation has paid 6 per cent on its preferred stock since its organization as the holding company in 1915. The preferred stock of the Interborough Consolidated, is non-cumulative. Last year its earnings, derived from Interborough Rapid Transit dividends, amounted to 7.14 per cent on its outstanding preferred stock.

Electric Railway Monthly Earnings

BATON ROUGE (LA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$20,321	*$10,962	$9,359	$3,917	$5,442
1m., Mar., '17	18,277	*9,637	8,640	3,525	5,115
12m., Mar., '18	236,118	*123,837	112,281	43,463	68,818
12m., Mar., '17	218,061	*102,432	115,629	42,212	73,417

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

1m., Mar., '18	$7,978	*$9,100	†$1,122	$1,372	†$2,494
1m., Mar., '17	8,413	*9,858	†1,445	1,167	†2,612
12m., Mar., '18	121,903	*123,455	†1,552	15,350	†16,902
12m., Mar., '17	125,302	*114,195	11,107	13,446	†2,339

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, CLEVELAND, OHIO

1m., Mar., '18	$42,252	*$27,210	$15,042	$11,421	$3,621
1m., Mar., '17	38,254	*24,322	13,932	11,389	2,543
3m., Mar., '18	118,422	*81,683	36,739	34,062	2,677
3m., Mar., '17	107,053	*68,047	39,006	34,261	4,744

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

1m., Mar., '18	$87,459	*$49,131	$38,328	$13,037	$25,291
1m., Mar., '17	76,062	*43,077	32,985	9,913	23,072
12m., Mar., '18	961,980	*535,977	426,003	146,715	‡305,356
12m., Mar., '17	862,126	*462,488	399,638	110,502	289,136

EL PASO (TEX.) ELECTRIC COMPANY

1m., Mar., '18	$107,532	*$68,350	$39,182	$6,588	$35,594
1m., Mar., '17	108,183	*67,849	40,334	5,114	35,220
12m., Mar., '18	1,273,511	*814,316	459,195	70,951	388,244
12m., Mar., '17	1,163,578	*713,531	450,047	60,593	389,454

JACKSONVILLE (FLA.) TRACTION COMPANY

1m., Mar., '18	$78,899	*$51,080	$27,819	$15,989	$11,830
1m., Mar., '17	61,510	*38,338	23,172	15,777	7,395
12m., Mar., '18	733,980	*501,123	232,857	190,964	41,893
12m., Mar., '17	643,882	*431,016	212,866	185,832	27,034

LAKE SHORE ELECTRIC, RAILWAY, CLEVELAND, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$164,940	*$121,542	$43,398	$36,227	$7,170
1m., Mar., '17	132,542	*90,386	42,156	34,369	7,787
3m., Mar., '18	447,657	*348,220	99,437	108,650	†9,213
3m., Mar., '17	380,290	*273,502	106,788	103,125	3,663

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

1m., Mar., '18	$299,172	*$173,024	$126,148	$28,238	‡$107,493
1m., Mar., '17	199,545	*114,173	85,372	29,182	56,190
12m., Mar., '18	2,839,727	*1,593,416	1,246,311	346,484	‡957,327
12m., Mar., '17	2,000,099	*1,188,249	811,850	347,923	463,929

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

1m., Mar., '18	$25,848	*$17,274	$8,574	$8,070	$504
1m., Mar., '17	25,394	*20,529	4,865	7,278	†2,413
12m., Mar., '18	303,213	*230,241	72,972	92,558	†19,586
12m., Mar., '17	311,898	*226,956	84,942	86,404	†1,462

PENSACOLA (FLA.) ELECTRIC COMPANY

1m., Mar., '18	$37,035	*$23,787	$13,248	$8,136	$5,112
1m., Mar., '17	25,220	*15,999	9,221	7,818	1,403
12m., Mar., '18	380,689	*229,982	150,707	94,337	56,370
12m., Mar., '17	289,452	*165,299	124,153	92,764	31,389

SAVANNAH (GA.) ELECTRIC COMPANY

1m., Mar., '18	$94,377	*$64,355	$30,022	$24,944	$5,078
1m., Mar., '17	77,252	*52,672	24,580	24,077	503
12m., Mar., '18	1,019,522	*683,811	335,711	293,366	42,345
12m., Mar., '17	855,893	*566,586	289,307	284,792	4,515

TAMPA (FLA.) ELECTRIC COMPANY

1m., Mar., '18	$92,931	*$50,945	$41,986	$5,086	$36,900
1m., Mar., '17	89,765	*46,954	42,811	4,373	38,438
12m., Mar., '18	995,353	*573,696	421,657	58,550	363,107
12m., Mar., '17	980,349	*534,499	445,850	52,328	393,522

* Includes taxes. † Deficit. ‡ Includes non-operating income.

Traffic and Transportation

P. S. C. Hearing Continued

President McCarter Examined in Regard to Various Details of Railway Company's Petition

At the continued hearing on May 16, 17 and 20 before the Board of Public Utility Commission of New Jersey on the application of the Public Service Railway, Newark, N. J., for increased revenues, President Thomas N. McCarter was examined in regard to various details of the company's petition. Marshal Van Winkle, counsel for the municipalities, questioned him in regard to the salaries paid by his company. Mr. McCarter said that the total was $130,000 or 0.65 of 1 per cent of the company's gross revenues, and that he would supply the details to the commission in confidence. He did not believe that it was to the public's interest and certainly not to the company's to have the information spread broadcast.

President Opposes Post Mortems

Most of the adjourned hearings on May 22 and 23 were taken up with the presentation of testimony by an accountant for the municipalities in the opening of their direct case. It was the opinion of this witness that the company is overcapitalized and that excessive rentals must be paid under old leases. Mr. McCarter objected to this class of testimony. After urging the urgency of relief, he read into the record a formal statement, in part as follows:

"The proof offered by the other side can only be intended to lay the foundation for an effort to persuade this commission to disregard consolidation agreements and leases, all of which were made more than ten years ago. Every one of these agreements was made according to the law as it stood at the time. They have been on record subject to inspection, and no attack on any has ever been made or suggested in any court having jurisdiction to pass upon their validity, and, surely, the commission has no jurisdiction to do so.

Present an Emergency Case

"If the proposed evidence is offered to show that the underlying and pre-existing companies were overcapitalized, we reply that this fact, even if true, is entirely irrelevant here, because Public Service Railway is not asking for increase of rates in order to pay interest or dividends on securities that never should have been issued, if any such are outstanding.

"This is not a rate case in the ordinary sense, but, if time permitted, the company would not object to having it so treated. It is clearly impossible to do so within the time that relief must be granted. The evidence in this case shows beyond doubt that the property of the electric railway is worth much more than $100,000,000, excluding the value of its franchise. The amount of value mentioned is shown by the very careful appraisement made by Dean Cooley, and the money expended on the property since that appraisement was made. By adding to the value so fixed the cash actually expended for the cost of establishing the business of the company and the value of property of the company not appraised by Dean Cooley, this value is clearly shown. The income of the company, if the increase asked for in the pending application should be allowed, would not give the company 8 per cent on more than $81,000,000, which is certainly much less than the value of its property."

The chief witness for the cities on May 24 and 27 was Delos F. Wilcox, of New York, who expressed the belief that the company ought to seek the consent of the individual municipalities to a modification of the franchise fare provisions. He favored the continued use of free transfers, believing that the transfer passenger almost always gets poorer service than straight cash passengers. He also advocated the advisability of the "one city one fare" idea as a matter of public policy.

Indiana Company's Strong Plea

In support of its petition for an increase in interurban passenger rates from 2 cents to 2½ cents a mile, the Chicago, South Bend & Northern Indiana Railway introduced evidence before the Public Service Commission of Indiana to show that for two years past the interest on the bonds of the company had not been paid out of earnings, but from funds provided by the directors of the company. It was brought out at the hearing before the commission that trucks and passenger automobiles are greatly reducing the revenue of the company.

H. O. Garman, engineer of the Public Service Commission, testified that his valuation of the property of the company would be $4,390,915 new, and that its present value is $3,816,203. Representatives of the company stated that the valuation of $3,816,203 was much too low, but that they would be willing to accept it for rate-making purposes, because they could show good reason for an increased rate of fare, even at that valuation.

Evidence introduced by Samuel T. Murdock, secretary of the company, showed that $5,774,000 in actual cash had been put into the property. Mr. Murdock testified that no money had been paid out for dividends; that nothing had been paid in salaries to directors, and that the directors paid their own traveling expenses.

No changes are being asked in the city fare in South Bend.

State-Wide Appeal in South

Public Utilities in Tennessee Put Before the Governor Their Case for Relief from Present Burdens

The officers of the public utilities of Tennessee who called upon Governor Tom C. Rye recently represented the state committee appointed by the national committee on public utilities. The members present were T. H. Tutwiler, president of the Memphis Street Railway, chairman; S. E. DeFrese, manager of the Chattanooga Gas Company, secretary, and representatives of other public utility corporations of the State.

Governor Asked to Inquire

As stated previously very briefly in the ELECTRIC RAILWAY JOURNAL, the object of the conference was to request Governor Rye to take official cognizance of the conditions under which public utility corporations of the State are now operating, and that he officially ask the co-operation of the public in helping these concerns to maintain their maximum efficiency in line with President Wilson's request for unrestrained co-operation by all the public of the United States with these institutions.

Besides addresses by Mr. Tutwiler and Mr. DeFrese, short talks were made by Col. A. M. Shook, Percy Warner and Col. H. M. Harvey.

Mr. Tutwiler called the Governor's attention to the fact that the rendition by these utilities of their respective services is vitally essential to the industrial, commercial and social welfare of the country, and particularly so during the present war. He pointed out that everything which the utilities must buy, acquire or pay for has advanced, while their hands are generally bound by contracts. They must sell their products at the pre-war prices, and unless they are given the same liberty as other individuals or corporations, or are otherwise relieved, the public utilities must stagger on toward inefficient service, final collapse and financial disaster. In this connection Mr. Tutwiler said in part:

"It is in anticipation of appealing for relief in the forms of increased rates or the elimination of some burdens, or both, that we have requested this conference with you as Governor, desiring to lay before you informally and generally some of the difficulties of the situation now confronting the public utilities of the State."

Mr. Tutwiler's Plea

Later Mr. Tutwiler in an interview emphasized the importance of maintaining the public utilities at their maximum efficiency. He quoted from the President's letter calling upon State and local authorities to act in accord with the necessities of the situation. Mr. Tutwiler added that the railway of Memphis had already filed application with the City Commission for a permit to increase rates from 5 to 6 cents, and that a number of other companies throughout the State were doing the same thing.

Syracuse War Fare Plea

City Agrees to Commission Assuming Control Provided Added Revenue Is Used to Help City

The New York State Railway's petition for an increased fare in Syracuse has been held open without date, by the Public Service Commission for the Second District, pending the investigation by Price, Waterhouse & Company of the books of the railway. This investigation is under way, following a conference by the Public Service Commission, the city and the railway company's representatives as to the form of the audit.

AGREEMENT WITH CITY DISCUSSED

The company's petition was heard by the commission on May 17. Corporation Counsel Hancock represented the city, Warnick J. Kernan of Utica and B. E. Tilton, general manager, the railroad company, and Lamont Stillwell, Solvay; George B. Dolson, Liverpool, and Irving Higbey, Eastwood.

Mr. Hancock told the commission about the agreement made by Syracuse and James F. Hamilton, vice-president and general manager of the New York State Railways, under which a wage increase was made from May 1 and an agreement reached as to submitting the 6-cent fare question to the Public Service Commission for a determination after the audit of the railway's books. He said the railway had agreed to its part of the agreement.

Mr. Hancock, for the city, formally withdrew objection to the commission exercising jurisdiction in the proceeding and in doing so called the attention of the commission to the following:

1. Any order made should protect Syracuse by providing that the petitioner shall consent to the exercise of jurisdiction by the commission in case the city should hereafter make an application for a reduction of any increased rate of fare which may be granted by the commission in this proceeding.

2. The question of the effect of the franchises granted by the city to the petitioner or of the statutes upon the jurisdiction of the commission is not before the commission and should not be passed upon, inasmuch as the proceeding is submitted to the commission by consent.

3. For the purpose of putting in issue any and all allegations of the petition bearing upon the necessity of justice of a 6-cent fare, the city formally denies the same.

4. In the event that the commission should decide that the petitioner is entitled to the increased fare within the city, the attention of the commission is called to the fact that a very important consideration influencing the city to consent to the exercise of jurisdiction by the commission was assurance of the petitioner that it would take steps to insure the expenditure of any increased revenue received in Syracuse for the benefit of its Syracuse system, and the city now asks that any order made herein require, so far as the commission can, that the Syracuse system receive the benefits of any increased revenue which may accrue in Syracuse from any order which may be made in this proceeding.

5. The city of Syracuse does not in the event that the commission decides that the petitioner is entitled to increased revenue within the city, in any way concede that a 6-cent fare would produce an increased revenue, or that the petitioner should not first be required to retain a 5-cent fare with an additional charge for a transfer. The city simply suggests that this question should be considered by the commission in fairness to citizens who believe that a 6-cent fare will not produce increased revenues commensurate with the additional burden imposed upon those compelled to pay the same, and that an additional charge for a transfer would be more profitable to the petitioner and fairer to the public.

Mr. Kernan, representing the New York State Railways, said he agreed with Mr. Hancock's statement. The company had already committed itself to the expenditures of the Syracuse revenues in a wage increase of 4 cents an hour, but Mr. Tilton did not feel that he should pledge himself at this time to further specific details. The company recognizes the fairness of the city and it will be the effort of the company to see that of any increase in revenue in Syracuse the city receives the benefit of the increase.

"I want you to go further," said Chairman Hill, "and say not only what the intentions of the railroad are but that you will agree that the commission may hold you to the intentions."

"I now agree," said Mr. Kernan, "that under the proposition of Mr. Hancock whatever order is made may have a provision to that effect so far as the commission can do so by any order entered at this time."

The representatives of Solvay, Liverpool and Eastwood asked that any determination affecting Syracuse should also apply to lines to those places. The railways' representatives agreed with these suggestions.

A WAR MEASURE

Chairman Hill said that the question was being treated as a war measure in order to get a prompt adjustment of the fare matter. According to Mr. Hill the question came down to one of ratio of income to investment.

Zones in Pittsburgh June 20

The expected new schedule of rates of fare on the lines of the Pittsburgh (Pa.) Railways was announced on May 20 to become effective on June 20. Signs were posted in the cars, but these gave no information beyond stating that the new schedules could be seen at the company's offices and at the carhouses.

In the majority of cases the fare is 7 cents, but on all lines a point is designated to which a ride may be had for 5 cents, based closely on a radius of 2 miles from the center of the city. Where there is a loop at or near the 2-mile point, this is usually selected as the limit of the 5-cent fare.

Five cents will be charged on the crosstown line, but transfers from those cars to other lines for a ride beyond the 2-mile limit will be charged for at 2 cents. No tickets will be sold in lots of less than eight, and the charge for eight will be 55 cents. Six-cent fares in Pittsburgh are abolished, but for municipalities surrounding the city and on lines of the company they will be the rule within the municipal limits, except that McKeesport will have a 5-cent fare somewhat similar to that prescribed for Pittsburgh.

A booklet has been issued by the company giving the details of the increases in fares.

The decision to go to zone fares was noted in the ELECTRIC RAILWAY JOURNAL of May 25, page 1029.

New I. T. S. Rates

Brief Review of the Decision of the Illinois Commission Extending Relief from War Burdens

The decision of the Public Utilities Commission of Illinois allowing increased rates to the Illinois Traction Company, Peoria, Ill., referred to briefly in the ELECTRIC RAILWAY JOURNAL of May 25, page 1029, was rendered on May 16. The commission granted almost in its entirety the petition of the company for emergency relief for electric railway, electric light and gas property in fourteen cities in which the company operates. In Cairo and Jacksonville 6-cent fares are allowed, while in Bloomington, Decatur, Danville, Champaign, Urbana, Galesburg and Quincy the company is permitted to eliminate tickets and go to a straight 5-cent fare.

AN EMERGENCY CASE DECIDED QUICKLY

The case was presented and considered as an emergency matter. The presentation of the testimony in connection with it has been referred to previously in the ELECTRIC RAILWAY JOURNAL. The primary purpose of the application of the petitioners was to secure necessary additional operating revenue to meet temporary abnormal conditions. The commission says some of the changes proposed were so radical in their nature, so far-reaching and in some instances were so indefinite in their effect, that in the opinion of the commission they should not be approved upon such record as was made in the case. In this connection it says that the action of the commission at this time in regard to these matters is not to be considered as the final determination of their merits and that they may be presented in separate proceedings for further consideration by the commission if the petitioners so desire. Considering the facts and circumstances, however, the commission finds that certain classifications, rates, rules and regulations omitted from the schedules of the petitioners were just and reasonable and should be continued in full force and effect as provided.

Four principal questions were raised by the objectors to the increases proposed in the various schedules. It was contended, first, that the ordinances granting franchises constituted a contract which precluded the commission from increasing the rates; second, that each separate utility should be charged with its separate expenses and credited with its separate earnings, and that the return to be allowed should be computed separately for each class of service rendered, irrespective of emergencies; third, that a detailed valuation and appraisement of each separate utility should be made; fourth, that the companies should be content to receive returns upon their investment much less than are ordinarily adequate and reasonable and if necessary to forego all return if to receive the same necessitated an increase in rates.

With regard to the first contention,

the commission was of the opinion that it was without force and quoted from previous cases decided by it. With respect to the second contention, the commission said that for the purpose of the present case it was not necessary to make a complete separation of the various units of property that constituted the combined plant of a single company. With regard to the third contention, the commission was of the opinion that a complete and detailed valuation of each of the petitioner's properties was not necessary to a determination of the issues involved. With respect to the fourth contention, the commission considered it was without force. The commission held that it was its duty in each case to determine what might be reasonable rates alike for the public and the utility.

SHOULD REGULATE RATES UPWARD AS WELL AS DOWNWARD

In a separate opinion by Mr. Lusey, commissioner, especially concurring, he said:

"The respective utilities clearly demonstrated the necessity for the relief petitioned for, and I am of the opinion the schedules filed should have been approved as a plain matter of right. I regard it as just as much the duty of this commission under the law to afford relief to a utility even though such relief results in increased rates to the public when the facts and circumstances warrant such relief, as I regard it the duty of the commission to afford similar relief to the public, by a reduction of the rates, when the facts and circumstances warrant such action, and I am further of the opinion that the public served by these respective utilities neither expect nor desire that the utility shall furnish service at a return which will not pay the operating expenses of the utility, much less allow any return on the money which has been invested by the stockholders."

The new rates are effective from May 1. They are to remain in force for the period of the war, the commission, however, retaining jurisdiction on this point.

Municipal Line Increases Fares

New rates went into effect on May 1 on the Edmonton (Alta.) Radial Railway, operated by the city. As a result the cash fare has been increased to 7 cents till 11 p.m. After that hour the rate is 10 cents. The revised rates fixed by the Council are as follows: Tickets purchased off the cars at ticket-selling stations, five for 25 cents; tickets bought on the cars, four for 25 cents. No workmen's tickets are now issued. Children under six years of age are carried free. Tickets for children more than six and under fifteen years of age, and high school pupils carrying certificates, ten for 25 cents, or one-half fare. Children carried after 11 p.m. pay half fare. Between 5 and 6.50 p.m., 5 cents is charged on baby carriages and large parcels. No change has been made regarding transfers.

Up to May 21, the new tariff had worked very satisfactorily. It is hinted that there is a slight decrease in traffic, but on the whole, the revenue compared with the same period last year has increased.

The ticket system is of great benefit on the one-man cars. It saves considerable time in collecting fares and making change.

New St. Louis Fare Insufficient

Richard McCulloch, president and general manager of the United Railways, St. Louis, Mo., on May 24 announced that he estimates the 6-cent car fare granted by the State Public Service Commission will be insufficient to cover the increased cost of wages, material and taxes, and as soon as this is demonstrated—if it is—the company will ask the State body to grant a further increase in the fare. Mr. McCulloch also announced that the commission will be asked to grant a 6-cent fare in St. Louis County.

Albany Fare Changes Suspended

The Public Service Commission for the Second District on May 21 ordered suspended the operation of the tariff schedule of the United Traction Company which was filed with the commission on May 2. The commission's order directs the suspension of the new rates for sixty days from and including June 2, or until Sept. 29. The commission has decided that it will order a hearing concerning the propriety of the proposed increased fares and that pending the hearing and decision, the suspension of the new rate schedule is ordered.

The new schedule was filed on May 2 and would have become effective on June 2 if sanctioned by the commission. It provided that a rate of 6 cents per capital was to be charged for one continuous ride between Albany and Rensselaer and that transfers were only to be issued within the "Albany-Rensselaer Through Zone."

The first official action by the cities affected by the proposed new schedule of fares was taken by the city of Rensselaer. Mayor McIntyre, through Corporation Counsel Ernest L. Boothby, filed an objection to the proposed schedule on the grounds that the rates contained therein, as far as Rensselaer is concerned, were "unlawful, excessive, inequitable and discriminatory."

Mayor McIntyre contended that the United Traction Company was prevented, by statutory limitations, from increasing the rate of fare or changing the system now governing the issuance of transfers. Under the regulations which have been in force the rate of fare between points in Albany and Rensselaer is fixed at 5 cents, with the privilege of transfer to points within the lines operated in the two municipalities.

At a conference of officials representing Albany, Rensselaer, Troy, Watervliet and Cohoes, held recently, it was decided best to have each city and community affected by the new rate schedule conduct its own case, as the aspects differ.

Union Traction Company Hearing Concluded

The hearing of the petition of the Union Traction Company of Indiana, Indianapolis, Ind., to the Public Service Commission of that State, to increase its interurban passenger rate to 2½ cents a mile was held before the commission on May 22. Evidence introduced showed that it was anticipated the deficit of the company for the year 1918 would amount to $273,290, after deducting sinking funds and fixed charges. The chief engineer of the commission indicated that he thought $33,000 a mile was a fair value to use in making an estimate of the property for a rate-making basis. Representatives of the company stated that this value was too low in comparison with similar properties, and that such properties had been valued at more than $50,000 a mile. The company's inventory shows a total valuation of $15,616,463, and the value of the interurban property as $13,642,667. The engineer of the commission thought this was very conservative, and that the physical value of the interurban property alone was probably about $15,500,000.

Transportation News Notes

Wants to Eliminate Tickets.—The Fort Wayne & Northern Indiana Traction Company has filed a petition with the Public Service Commission of Indiana asking authority to eliminate its six-for-a-quarter tickets in Logansport, and to abandon its track on High Street in that city from Sixth Street to Spencer Park. The petition also requests authority to use one-man cars in Logansport and on certain lines in Fort Wayne.

Schenectady Fare Petition Withdrawn.—The Public Service Commission, for the Second District of New York at its regular session on May 23 granted an order permitting the Schenectady Railway to withdraw its petition for a 6-cent fare. No special hearing on the merits of the petition was held, but on April 18, after the decision of the Court of Appeals in the Quinby case, there was a hearing as to whether or not there was a franchise limitation in Schenectady.

Dallas Skip Stop Giving Satisfaction.—The skip-stop system of operation, now being tried by the Dallas Railway in the downtown section of the city and on the Ervay Street line, will likely be extended to all lines in the city, according to announcement by Richard Meriwether, general superintendent of the company. Mr. Meriwether reports a saving in schedule time of 12 to 15 per cent on lines on which the skip-stop system is in operation. There has been

practically no complaint of inconvenience from patrons.

Lincoln Now Suggests Six-Cent Fare.—The State Railway Commission of Nebraska has deferred action upon the motion of City Attorney Peterson for a reopening of the case to take additional evidence regarding the value of the Lincoln Traction Company's property. E. J. Hainer, counsel for the company, urged that the commission increase the rate of fare first and then proceed to take an inventory of the company's property if it wanted one. He said that a 5-cent fare, originally asked for by the company, would not be enough. He urged a 6-cent fare.

Preparing for Portland Hearings.—It is expected that on June 8 the final cross-examination will be conducted in connection with the application of the Cumberland County Power & Light Company, Portland, Me., for an increase in fares on the Portland Railroad, operated under lease, and that on the same day the testimony of the opposition will be presented. The company is seeking a 6-cent fare in the central zone, covering the thickly populated sections of Portland and South Portland, with 2 cents a zone outside. The case was opened early in March, and the tariff providing the rates just mentioned is under suspension.

Courts Against Dallas Jitneys.—Jitneys in Dallas, Tex., have lost again in their fight for the right to continue operation. The State Supreme Court has held the Lindsley ordinance, enacted during the administration of Henry D. Lindsley as Mayor and designed to put the jitneys out of operation, to be valid in all particulars and a proper exercise of the police powers lodged in a municipality. The case grew out of an attempt by the city to enforce this ordinance. It has been in the courts for nearly two years. Some of the moves in connection with the matter were reviewed briefly in the ELECTRIC RAILWAY JOURNAL for May 25, page 1031.

Increased Tariff Filed for Elmira.—The Elmira Water, Light & Railroad Company, Elmira, N. Y., on May 23 filed with the Public Service Commission for the Second District a new tariff schedule affecting local passenger traffic, to go into effect on June 20. The changes proposed were: Fares between points on lines other than Seneca Lake division, except between points within the city limits of Elmira, corporate limits of Elmira Heights and Horseheads, increased 1 cent. Fares between points on the Seneca Lake division, Center Mills, Croton, Elmira, Horseheads, Millport, Mountour Falls, Pine Valley and Watkins, increased to basis of 2 cents a mile.

Package Car Discontinued.—The Beaver Valley Traction Company, New Brighton, Pa., has filed with the Public Service Commission a notice of discontinuance of its package car, effective on June 8. The package car business of the company has been continuously decreasing. The total daily mileage operated by this car approximates 70 miles. The operating cost per car-mile, due to present business conditions, runs as high as 28 cents or a total cost of operating this car of $19.60 a day, while for the last three months the average daily receipts have been $7.15 a day. These facts have all been explained by the company in a notice addressed to the patrons of the car.

Lewiston Fare Case Being Heard.—A hearing was held on May 21 before the Public Service Commission of Maine on the application of the Lewiston, Augusta & Waterville Street Railway for permission to increase its zone charges from 5 cents to 7 cents. Subsequently cross-examination was conducted and it was expected the case would be closed on May 29. A decision will probably be handed down without delay as this is an emergency case. The company did not earn its operating expenses for the first quarter of 1918. It is also beset by the prospect of higher interest on obligations maturing in 1918 and a new wage scale. Some time ago the property was re-zoned, ten 5-cent fares being substituted for seven 5-cent zones in one instance.

New C. E. T. A. Tariff.—The Central Electric Traffic Association issued under date of May 9 effective on June 15 joint passenger tariff No. 19, canceling joint passenger tariff No. 17, of rates for interchangeable 2000-penny coupon tickets. This interchangeable 2000-penny coupon ticket will be honored between all stations on the roads participating in the tariff, located in Illinois, Idaho, Indiana, Kentucky, Michigan and Ohio. These penny coupon books are to be used for purposes of simplicity, it being possible to tear off the exact fare and make them available for use with any rate of fare. The coupons are perforated along the strip so that one-half of the detached strip of coupons can be retained by the road lifting the same and one-half can be used in balancing accounts. Roads other than those listed are also considering using these books.

Uniform Steps in Spokane.—E. E. Lillie, superintendent of the Spokane Traction Company, has agreed to make a standard of height of less than 17 in. on all steps by removing the block from the truck bolster. Heretofore there has been no standard at which the treads of the step should be maintained above the rail. They have varied from 15½ in. to 21⅝ in. It is also proposed to change the gate operation. At present the gates are operated by the motorman, but hereafter the conductor will operate the gates. Disappearing steps will be attached to the gates so that when the gates are open a step will come out from under the present step. The steps of the cars of the Washington Water Power Company were formerly 18¼ in. above the rail, but in the majority of cases these have been lowered to 15 in. As the cars go through the shops the platform sills are being lowered to this standard.

St. Joseph Wants Six-Cent Fare.—The St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has an application pending before the Public Service Commission of Missouri for permission to increase its railway rates from 5 cents to 6 cents. Last February the company obtained permission to eliminate the sale of tickets at reduced rates and went to a straight 5-cent fare. In this connection J. H. Van Brunt, vice-president and general manager of the company, has made a statement to correct the impression that the company received a 1-cent fare increase through the order eliminating tickets. He has pointed out that the majority of fares before the installation of the straight 5-cent fare were not tickets. The average fare was 4.67 cents. This made the increase only 0.33 of a cent. Mr. Van Brunt says that while this has helped, it has by no means dammed the leak in the expense accounts of the company.

City Agrees to Advance in Fare.—The Public Service Commission for the Second District of New York on Jan. 31, after an investigation, permitted the Waverly, Sayre & Athens Traction Company to increase its rate of fare in Waverly to 6 cents. The company filed a tariff but later voluntarily canceled it upon ascertaining that there existed a franchise restriction limiting fares to 5 cents. The trustees of Waverly, by resolution on May 8, modified the franchise restriction so as to permit a 6-cent fare during a certain period. The commission on May 23 granted an order permitting the company to file a new tariff, effective from June 1. This enables the company to make a 6-cent fare on the entire line; that is, 6 cents from Waverly to Sayre and 6 cents from Sayre to Athens. The company collects 12 cents from Waverly to Athens on through passengers, also a 6-cent fare in the village of Waverly. The right to charge 6 cents in Pennsylvania is not limited to a period of the war, as is the case in New York State.

Increase in Fare Asked for Wilmington.—The Tidewater Power Company, Wilmington, N. C., has appealed to the Corporation Commission of that State for increased fares. The company desires to charge a flat 6-cent fare on its city lines and to discontinue the sale of tickets for local rides. The company would also advance fares over the line from Wilmington to the beach. Instead of the present rate of 35 cents for the round trip to the beach, or three round-trip tickets for $1, the company asks that it be permitted to charge a straight cash fare of 25 cents and 20 cents for tickets. To Wrightsville Sound, it asks permission to raise the rate to 25 cents for the round trip or 15 cents straight fare. In Wilmington, chief interest is centered on the proposal to advance the commutation rate to residents of the beach traveling to Wilmington. This special rate, for twenty-six round-trip tickets, has been $7.80 from Wilmington to Wrightsville Beach and the company asks to advance it to $9.36. Between Wrightsville Sound and Wilmington it asks for an increase in the commutation rate from $4.68 to $5.85 for the twenty-six round-trip tickets.

Personal Mention

George R. McComb has been appointed assistant treasurer of the Illinois Traction System, Peoria, Ill., to succeed W. H. Carnahan, deceased.

W. H. Elder has resigned as secretary and auditor of the United Traction Company, Albany, N. Y., to become connected with a firm of public accountants in New York City.

E. B. Smith, formerly with the Arkansas Valley Railway, Light & Power Company, Pueblo, Col., has been appointed auditor of the Muskogee Gas & Electric Company, Muskogee, Okla., succeeding J. H. Schmidt who has resigned to enter business for himself.

Alba B. Johnson, Philadelphia, who is president of the Baldwin Locomotive Works, on May 24 was elected president of the Railway Business Association. Mr. Johnson succeeds George A. Post, New York, who had served as head of the association since its formation in 1908.

Horace A. Abell, of the engineering department of the New York State Railways, Rochester, N. Y., has been appointed engineer in charge of way and structures of the Rochester lines of the company. Mr. Abell succeeds Donald B. Falconer, who resigned on April 1.

S. H. Grauten has been appointed electrical engineer of the Kansas City (Mo.) Railways, his duties covering design, construction and operation of the substations and electrical distribution system. This work includes the rehabilitation started about a year ago and under which three substations have been completed and will soon be in operation.

Chester P. Rexford has been appointed claim agent and park manager of the Union Street Railway, New Bedford, Mass., to succeed the late Isaac W. Phelps, who was claim agent for twenty-two years. Mr. Rexford went to work for the company on Sept. 8, 1902, in the office. He then rose gradually through the offices of cashier and paymaster and on Nov. 1, 1910, was appointed to the accident department as assistant to Mr. Phelps. He has also been assistant park manager up to this time.

Charles J. Finger has been elected president and treasurer in charge of operation of the Columbus Magnetic Springs & Northern Railway, Richwood, Ohio. Mr. Finger's record in railway work dates back twenty-five years, and includes service on South American roads, the Texas & Pacific Railroad and in the central part of the country. He was general manager of the Ohio River & Columbus Railway and combined lines. He was later appointed receiver and general manager of the Ohio River & Columbus Railway.

Archie Evans, for a number of years secretary to H. B. Fleming, chief engineer of the Chicago (Ill.) Surface Lines, has been commissioned a first lieutenant in the construction division of the Quartermasters' Corps, National Army, and on May 14 reported for duty at Washington, D. C. Mr. Evans became connected with the Chicago City Railway in 1906 as a stenographer and after several promotions was made secretary to the chief engineer, the duties of which position he has continued to perform under the new arrangement of unified operation of the surface lines.

Henry Worth Thornton, an American, whose appointment four years ago as general manager of the Great Eastern Railway, England's most important system, caused much comment both here and abroad, has been named a brigadier general of the British Army. Mr. Thornton received the rank of colonel shortly after the beginning of the war and was advanced to brigadier general in appreciation of his exceptionally efficient work as director of the Channel transports. Previous to going to England Mr. Thornton was general superintendent of the Long Island Railroad and president of the Northwestern Railway, operating the electric railways at Meadville, Pa., and vicinity.

John M. Ryan has been appointed roadmaster of the Boston (Mass.) Elevated Railway surface lines, succeeding to the position recently resigned by Col. T. F. Sullivan. Mr. Ryan was graduated from the Norwich University, Northfield, Vt., with the class of 1895, receiving the degree of C. E. The same year of his graduation he entered the service of the engineering department of the city of Cambridge. In 1897 he became connected with the Boston Elevated Railway in the civil engineering department. In 1899 he was appointed engineering inspector on surface track construction work. In 1912 he went from the engineering force to the road department of surface lines, being appointed supervisor of surface tracks.

V. R. Hawthorne has been elected acting secretary of the Master Car Builders' Association and the Master Mechanics' Association. He has been serving as temporary secretary of the associations since the death of J. W. Taylor. Mr. Hawthorne was born at Oleon, Pa., on Nov. 27, 1886. He entered the service of the Pennsylvania Railroad in June, 1905, and has been with the company continuously since that time. While at Altoona for that company he was appointed on the M. C. B. special committee making time studies. Early in 1917 he was appointed special master car building inspector, reporting to J. T. Wallis, general superintendent of motive power of the Pennsylvania Railroad. He was assigned on special M. C. B. committee work of the American Railway Association in April, 1917.

F. D. Ward has been appointed superintendent of rolling stock, for the Bay State Street Railway, Boston, Mass., succeeding to the duties of H. W. Irwin, acting superintendent of car repairs, recently resigned. Mr. Ward's first experience in railway work began with the Grand Avenue Railway, Kansas City, back in the nineties. Later he became associated with properties in Chicago, controlled by the late C. T. Yerkes. When Mr. Yerkes became interested in the London, England, underground railway properties, he took Mr. Ward with him to look after the car equipment for the new tubes. For about eleven years he was associated with the American Car & Foundry Company, doing important engineering work on car design and equipment. A period of this time was spent in Italy, where he had charge of a large car equipment contract for his company. For the last four years Mr. Ward has been an active member of the Smith-Ward Brake Company, New York.

Albert E. Gulliver, chief engineer of the power station of the Trenton & Mercer County Traction Corporation, Trenton, N. J., has resigned his position to engage in special work for the British government pertaining to marine operations. He will be located in Canada and will make his home in Halifax. Mr. Gulliver became connected with the Trenton company two years ago. He was formerly in the employ of the Public Service Corporation of New Jersey. Mr. Gulliver was graduated from the London Polytechnic Institute. After leaving school he entered the employ of Harland & Wolf, at Belfast, noted shipbuilders and engineers. Later he was commissioned in the Royal Indian Marine, a branch of the English navy. During the Boer war he was engaged in the transport service and later in the merchant marine, plying across the North Atlantic. He then settled in the United States and became erecting engineer for the Westinghouse Electric & Manufacturing Company.

Obituary

Edward C. Meier, president of the Heine Safety Boiler Company, Phoenixville, Pa., died suddenly on May 7, while attending the meeting at Philadelphia of the District Production Division of the Emergency Fleet Corporation. He was stricken just after making a short address giving his views on speeding up the construction of boilers and died within a very short time. Mr. Meier was born in 1870. He was a son of Col. E. D. Meier, founder of the Heine Safety Boiler Company, and became president of the company in 1916 on the death of his father.

Construction News

Construction News. Notes are classified under each heading alphabetically by States.
An asterisk (*) indicates a project not previously reported.

Franchises

Selma, Ala.—The Selma Traction Company has received a thirty-year franchise from the City Council of Selma to construct a line from Alabama Avenue and Mechanic Street to the Municipal Swimming Pool.

Butte, Mont. — The Butte Electric Railway has received a franchise from the City Council to construct double tracks along Main Street from Galen Street to Quartz Street.

Newark, N. J.—The Board of Commissioners of Newark has granted permission to the Public Service Railway for a double-track extension of its tracks from Chestnut Street through Elm Road and Gotthardt Street to Hamburg Place, ½ mile.

Caledonia, Ohio. — The Columbus, Delaware & Marion Railway has received a franchise from the County Commissioners to erect electric transmission lines from Marion to Caledonia, about 10 miles.

Tulsa, Okla.—The City Commission of Tulsa has repealed the ordinance recently passed granting the Oklahoma Union Railway a franchise for an outlet to the north of Tulsa, including right-of-way over First Street. The ordinance was enjoined by property owners on First Street and this case is now pending in the courts. It was claimed that a franchise such as was granted was worth at least $200,000, whereas the company was paying nothing for it.

Montpelier, Vt.—The Barre & Montpelier Traction & Power Company will receive a new franchise from the City Council of Montpelier.

Track and Roadway

***Decatur, Ala.**—The construction of an electric railway from Decatur to Florence, Sheffield and Tuscumbia, a distance of about 45 miles, is under consideration. H. L. Morrill and D. S. Echols, Decatur, and C. E. Warwick, Vicksburg, Miss., are interested in the project.

San Diego (Cal.) Electric Railway.—Work has been begun by the San Diego Electric Railway on the reconstruction of 1 mile of track in San Diego.

Municipal Railway of San Francisco, San Francisco, Cal.—The United States War Department has tentatively offered to furnish $150,000 for the extension of the Potrero line from the Union Iron Works to Hunter's Point, where the new government drydock is to be constructed. While the government will own the line, it will be operated as part of the Municipal Railway and will ultimately be taken over by the city. Under the tentative plans, employees and passengers will be carried in the daytime and between certain hours at night only material will be carried. Under the present plan, the line will operate on Army Street to Kentucky Street, south to Evans Avenue and then out to Hunter's Point Boulevard.

***Savannah, Ga.**—The Foundation Company contemplates the construction of a 1-mile line from its shipyard on the Brampton Tract to connect with the Port Wentworth extension of the Savannah Electric Company.

Chicago (Ill.) Surface Lines.—Work has been begun by the Chicago Surface Lines on the construction of a 5-mile extension from South Chicago to Hegewisch. Upon the completion of the Monroe Street bridge construction will be begun on an extension of the Monroe Street line from Franklin to Canal Streets. The bridge will be opened to the public by August and the car line will be completed a month later.

Evanston (Ill.) Railway.—This company will rehabilitate its tracks between Dempster Street and Main Street at a cost of about $30,000. New steel rails will be laid on a concrete foundation.

Tri-City Railway Company of Illinois, Rock Island, Ill.—Double tracks will be laid by the Tri-City Railway Company of Illinois along Eleventh Street from Eighteenth Avenue, Rock Island, to Center Station and Sears, Ill. The present right-of-way is desired by the city for street purposes and the company will give the city a deed for this right-of-way. The company also agrees to double-track Eleventh Street from Eighteenth Avenue to Aiken Street when required. In return for this service the city guarantees that it will extend for twenty years the franchise of the company in South Rock Island Township which will expire within two years.

Inter Urban Railway, Des Moines, Ia.—Work will be begun at once by the Inter Urban Railway double tracking 1600 ft. of its Camp Dodge line, south of Brennan Crossing. Bids have been advertised for grading the cut just beyond the Beaver crossing, where 3000 ft. of double track will be laid.

Bay State Street Railway, Boston, Mass.—As a result of conferences by government officials, the Quincy City Council, General Manager Wakeman of the Fore River Shipbuilding Yard and R. B. Stearns, vice-president of the Bay State Street Railway, about $150,000 is to be spent in improving the present facilities of the Bay State Street Railway in Quincy. The government experts reported that, while the power was ample, its distribution was poor owing to the extraordinary demands made upon it. They have accordingly recommended that a substation be established at the Hancock Street carhouse. The temporary bridge across the Neponset River is to be widened to accommodate a double track. Part of the cost of these improvements will be paid by the government.

Detroit (Mich.) United Railway.—Work will be begun soon by the Detroit United Railway on the construction of an extension to the Ford submarine chaser plant in Springwells.

***Caledonia, Minn.**—It is reported that the right-of-way for an electric railway between Caledonia and Houston has been purchased. It is stated that officers of the Preston Light & Power Company, Preston, Minn., are interested in the project.

McComb & Magnolia Railway & Light Company, McComb, Miss.—A report from the McComb & Magnolia Railway & Light Company states that the company plans to place in operation 4 miles of its line, between McComb and Fernwood, this year. Guy M. Walker, New York, N. Y., president. [Dec. 29, '17.]

Jersey Central Traction Company, Keyport, N. J.—After the Jersey Central Traction Company had refused to obey the order of the Middlesex County Board of Freeholders and make certain repairs to the tracks on Stevens Avenue, South Amboy, the county body refused to allow the company's cars to operate on that thoroughfare. Director William S. Dey, of the Board of Freeholders, had the tracks on Stevens Avenue buried in sand, thus preventing cars from being run. William Hitchcock, general manager of the company, promised to make the repairs and the freeholders agreed to remove the sand.

Brooklyn (N. Y.) Rapid Transit Company.—The Brooklyn Rapid Transit Company has announced its intention of restoring service on the Norton Point railroad line between the Sea Beach-West End terminal and Sea Gate at Coney Island. Last October the operation of this line was stopped because of the reconstruction of the elevated lines to Coney Island, and the building of the new terminal there. A trolley service was substituted on Surf Avenue with transfer privileges at Thirty-seventh Street to Sea Gate. Transfers were also given to the Culver and the Brighton Beach lines. These privileges will be continued when the rapid transit service is restored.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York recently received bids for the construction of column foundations for Route 49, Section 3, a portion of the Culver Rapid Transit Railroad in Brooklyn.

The lowest bidder was William G. Cooper, Inc., New York, whose proffer was $171,256. Bids were also received by the commission for furnishing two portions of ballast for new rapid transit lines. The Upper Hudson Stone Company, New York, bid $1.90 for portions *D* and *E* of this contract, while the New York Trap Rock Company bid $2.05 for portion *B* and $1.85 per cubic yard for portion *E*. All of the above bids have been taken under consideration by the commission.

Interborough Rapid Transit Company, New York, N. Y.—The Board of Estimate on May 28 voted $300,000 in corporate stock for the Interborough Rapid Transit Company to complete the connections between the old subway and the new subway at Times Square, Manhattan, and Borough Hall and Atlantic Avenue, Brooklyn.

Northern Ohio Traction & Light Company, Akron, Ohio.—Work will soon be begun by the Northern Ohio Traction & Light Company on the construction of an extension of its Belden Avenue line. The cost of the improvement will be approximately $50,000.

Chillicothe & Camp Sherman Electric Railway, Chillicothe, Ohio.—Application has been made by the Chillicothe & Camp Sherman Electric Railway to the Public Utilities Commission of Ohio for permission to issue $75,000 in common stock, $150,000 in preferred stock and $150,000 in first mortgage bonds for the construction of its proposed line from Chillicothe to Camp Sherman. George A. Vaughters, Chillicothe, is interested. [May 4, '18.]

Cincinnati (Ohio) Railway.—Mayor Galvin of Cincinnati recently received a letter from W. Kesley Schoepf, president of the Cincinnati Traction Company, setting forth the terms on which the proposed Warsaw Avenue extension will be made. The Price Hill Business Men's Club has proposed to finance the extension and provide the rails. Mr. Schoepf requires that the city or the people of Price Hill contract with a reliable contractor to build the extension according to standard specifications under the supervision of the city engineering department and with the approval of the company for the estimated sum of $112,078. He also specifies that the rails are to be obtained by the people of Price Hill and that they shall be of the new standard 7-in. section 91-375 type or any other section equally acceptable to the company. The total amount of the estimate for the construction of the extension must be placed with some bank or the guarantee of a bank must be obtained that it will make payment as the certificates are issued. The work must be commenced by July 1. Mayor Galvin said this matter is up to the people of Price Hill who made the proposition.

Niagara Falls, Ont.—The Ontario Railway & Municipal Board has approved the plans of the Provincial Hydro-Electric Commission for the construction of a line from Chippawa through the Township of Stamford. W. W. Pope, University Avenue, Toronto, secretary.

Dallas (Tex.) Railway.—The plan of the Dallas Railway to take up its track on Tyler Street from Seventh to Jefferson Street and to extend the so-called North Loop line westward out Seventh Street to the city limits, an extension of about 1 mile, has met with strong opposition on the part of residents of the North Loop section. These residents have presented their objection to M. N. Baker, supervisor of public utilities, who has promised a hearing before final action is taken. The North Loop residents assert that abandoning the track on Tyler Street will break all connection between the North Loop line and the Sunset and Bundary lines, thus effectively cutting Oak Cliff into two distinct street car districts. Since several amusement parks and other places have been built on the North Loop with the aim of drawing patronage from all of Oak Cliff, they would suffer material loss by the proposed changes in the street car lines.

Eastern Texas Traction Company, Dallas, Tex.—Construction work on the proposed interurban line to be built by the Eastern Texas Traction Company from Dallas to Greenville will be resumed as soon as the European war ends, according to announcement by J. W. Crotty, vice-president and general manager of the company, made to a stockholders' meeting held in Dallas recently. The proposition has been fully financed through the Dallas Electric Company, grading has been finished and all bridges built, and everything is in readiness for the laying of steel to begin as soon as conditions in Europe are such that steel can be secured. Lack of steel was declared to be the cause of the suspension of work. Fully $50,000 worth of crossties and a large amount of other material is now on hand ready for use as soon as steel is to be had. The stockholders' meeting was held for the election of directors, which resulted as follows: F. E. White, J. W. Crotty, Ralph Wade, J. W. Gardner and W. B. Hamilton, Dallas, and R. M. Chapman and Joseph F. Nichols, Greenville. The officers of the company were re-elected as follows: F. E. White, Dallas, president; J. W. Crotty, Dallas, vice-president and general manager; Joseph F. Nichols, Greenville, vice-president; and Ralph Wade, secretary-treasurer. (Feb. 23,'18.)

Shops and Buildings

Columbus, Ga.—A contract has been awarded to Gifford & Whittaker for the construction of a transfer station at the intersection of Tenth and Broad Streets for the convenience of street car patrons. The building will be approximately 40 ft. x 20 ft. and will be constructed of brick and stone. There will be a general waiting room, a ladies' rest room, a smoking compartment for men, colored waiting rooms and toilets. The cost will be about $7,000.

Public Service Railway, Newark, N. J.—This company is having its carhouse, which has been used as a storehouse at Washington Park for the past twenty years, moved from the site where the government bag loading plant is being constructed. Two galvanized buildings are being built to take the place of the structure being removed.

Long Island Railroad, New York, N. Y.—Plans have been prepared by the Long Island Railroad for the construction of a one-story brick engine house, at Eighth Avenue and Sixth Street, Brooklyn, about 38 ft. x 102 ft., to cost about $15,000.

New York (N. Y.) Railways.—The New York Railways has leased its former plant at 17 Front Street to the Battery Warehouse Corporation at an aggregate rental of about $200,000.

Power Houses and Substations

Tri-City Railway & Light Company, Rock Island, Ill.—A new 22,500-kw. turbine is being installed at the power house of the Tri-City Railway & Light Company in Moline.

Bangor Railway & Electric Company, Bangor, Me.—A 500-kw. generator is being installed in the Veazie power plant of the Bangor Railway & Electric Company at a cost of about $55,000.

Montgomery Transit Company, Norristown, Pa.—This company reports that it has under construction a new substation at Skippack.

Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa.—Current to assist in the operation of the Trenton, Bristol & Philadelphia Street Railway is now being supplied by the Trenton & Mercer County Traction Corporation, Trenton, N. J. A cable for the transmission of current from the Trenton company's power house was strung for 1½ miles through the streets and across the lower Delaware River bridge to Morrisville, where the Pennsylvania company's cable was tapped. The cable was strung at the request of the government so the trolley service running to the Tullytown and Bristol government plants could be improved.

Tacoma Railway & Power Company, Tacoma, Wash.—The city lighting department is considering a contract with the Tacoma Railway & Power Company, under which the company will install, maintain and operate the large generator which the city purchased and for which no space has been provided. The Tacoma company has offered, for $1,800 a year, to install it and operate the generator and hook it up with its own switchboard, so that if the peak load were exceeded the company could cut in the city line on its own current. Hamilton Gronen, commissioner of light, estimates that it would cost the city $10,000 to build a substation on the tideflats.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES · MARKET QUOTATIONS · BUSINESS ANNOUNCEMENTS

Armature and Field Coils Active

Anticipating Heavy Business During the Summer Months Railways Are Buying for Replacements

On account of severe spring storms, the demand for armature and field coils has increased measurably. One manufacturer, in commenting on market conditions, said the sale of armature and field coils to electric railways is very active. While it is a normal movement at this time of the year, in anticipation of heavy summer service, a greater quantity of coils is being purchased than a year ago.

This and other manufacturing companies are in a position to ship promptly. The only obstacle, it was stated, would be the freight embargoes and the difficulty of obtaining priority orders. It was conceded that on the question of priority certificates the official transportation committee was inclined to favor shipment of all material for traction roads and other public utilities. Prices, it was stated, have not been changed nor were any looked for. Concern was expressed in connection with obtaining material, although it was conceded an improvement in the situation was evident.

Westinghouse Company's New Works

Essington Plant Embodies the Latest Building Construction With Most Modern Equipment

Spurred on by the urgent need of the government for ships the Westinghouse Electric & Manufacturing Company has made a record in the erection and operation of its new works at Essington, or South Philadelphia, about 9 miles from Philadelphia on the banks of the Delaware River. The plant is now devoted entirely to the production of ship propulsion machinery for the navy and the merchant fleet. A little more than a year ago the present site was plowed field, now it contains seven large buildings which gives employment to 2500 people. These buildings, comprising a floor space of over 600,000 sq.ft., include a pattern storage shop, foundry forge shop, power house, erecting shop, and two machine shops.

Two steam railroads, an electric line and the river afford means of transportation, though the last mentioned has not as yet been utilized.

The greatly increased demands on the Westinghouse company for steam-electric generating units led to the necessity of seeking enlarged facilities, as those at East Pittsburgh were already crowded. It is expected that eventually this plant will be of a size comparable with the East Pittsburgh works, which now employ in the neighborhood of 25,000 people, and cover a floor space of more than 100 acres.

Commercial Bribery May Become Criminal Offense

The Federal Trade Commission Urges Enactment of Law in Order to Preserve Competition

The Federal Trade Commission has recently sent to both branches of Congress a communication urging "the enactment in the public interest, as an aid to the preservation of fair and free competition, a sufficient law striking at the unjustifiable and vicious practices of commercial bribery and that such law be so comprehensive as to strike at each person participating in any such transactions."

The Federal Trade Commission has found commercial bribery to be general throughout many branches of industry, and scores of complaints have been issued by it on that account. Fourteen states at present have laws prohibiting such practices, but they fail to reach the root of the evil and eradicate it—in fact, they are practically dead letters. The commission can only deal with commercial bribery as an unfair method of competition, having no criminal jurisdiction, and can deal only with one side, having no power to reach the receiver.

In its communication to Congress the commission states that it "has made considerable investigation of bribery of employees of customers as a method of securing trade. These bribes take the form of commissions for alleged services, of money and gratuities and entertainments of various sorts, and of loans—all intended to influence such employees in the choice of materials. It is evident that this inexcusable added cost is finally passed on to the consumers.

"Corrupt employees having the power to spoil and disapprove materials have been able to bid one salesman against another until in many cases they have extorted secret commissions, so-called, as large as 20 per cent of the value of the goods sold.

"In order to prevent a resort to a common method of corruption, it is recommended that the law should also prohibit the giving of any such gifts or other considerations to members of the agent's or employee's family, or to any other person for his use or benefit, direct or indirect."

Railway Credits Sound in Middle West

Many Roads Taking More Time and Are Frequently Giving Notes for Credit Extension

The credit of electric railways in the Middle West is just as sound as it ever was, in spite of the fact that it is sometimes impossible for the utilities to pay their bills as promptly as before the high level prices.

Electric railways are frequently asking for more time, although some continue to discount their bills and in a few cases bills are discounted where previously time has been asked. In general, when time is asked it is granted by the manufacturers although in a few instances manufacturers are holding strictly to thirty days and refusing business on any other basis.

In many cases credit is being taken in the form of notes, although occasionally it is refused altogether. Interest at 6 per cent is being charged on some overdue accounts and some manufacturers are trying to make this the basis of credit and time extensions. There is, of course, a limit to this service, as manufacturers might find themselves running a banking institution.

The fact that railways are asking for more time is due primarily to the high prices resulting from the war. Equipment, overhead and track have all suffered severely and unforeseen expenditures have been necessary at the prevailing high prices.

"Cost-Plus" Basis to Be Abandoned

The "cost-plus" basis of undertaking government work is more or less familiar to manufacturers in the electric railway field. It has caused dissatisfaction it appears for several cogent reasons. Now, to follow advices from Washington, D. C., the policy of the War Industries Board, as officially stated, in abandoning cost and percentage as a basis of contracts with the industries of the country which is now in force on steel where prices have been established, will be extended to other materials in the near future.

Upset prices for work will be divided with the government on the basis of affording profit over certain figures, with a system of premiums for early, and penalties for late delivery. The general tendency is to get away from the cost and percentage basis, because of the many opportunities which are afforded to manufacturers unduly to increase their costs.

War Absorbs the Entire Output of Metal Conduit

Shipbuilding Takes More Pipe than Was Originally Anticipated — Factories Are Behind in Their Shipments

Metallic conduit and conduit fittings are now in such a position that it is impossible to obtain deliveries without showing that the material is required for a project necessary toward the successful waging of the war. In order to secure pipe, manufacturers must show the ultimate use of the conduit. It will therefore be impossible, one of the manufacturers stated to a representative of the ELECTRIC RAILWAY JOURNAL, for a purchaser to secure new pipe after the present supply is exhausted, except for industrial purposes or such other purposes as are definitely linked up with the war.

The available supply of pipe is by no means sufficient to take care of the market. The shipbuilding program of the United States has taken a very large amount of conduit, much larger in fact than was previously anticipated. Factories are behind in shipments, but find themselves in no position to better the situation at present.

This situation in conduit came as a result of the manufacturers in the iron and steel industry pledging their entire output to the service of the government and our allies so long as required. The direct and indirect requirements of the United States and its allies, it is stated, are equivalent to between six and eight months' production. As a result commercial iron and steel for the moment are receiving no attention. This situation, of course, will continue as long as 100 per cent of the production is necessary for war purposes.

Bituminous Coal Prices Reduced Ten Cents

The Reduction Will Effect a Saving to Consumers of Approximately $60,000,000

Ten cents a short ton has been stricken from the mine price of all bituminous coal in the United States by order of Fuel Administrator H. A. Garfield. The new price took effect at 7 o'clock on Saturday morning, May 25, and represents an average reduction of nearly 5 per cent.

The reduction will mean an annual saving to consumers of a sum estimated by the Fuel Administration at $60,000,000. Under the President's plan, the railroads will furnish cars to all coal mines alike, without discrimination, except as dictated by the prior requirements of the railroads for operating purposes and the needs of operating consumers and of the war. The introduction of the principle of even car supply, it is expected, will reduce the general average overhead of mine operation, thereby justifying the administration in putting out a price reduction order. It is understood that the mine prices thus fixed will remain undisturbed until the United States Fuel Administrator has before him the cost returns for the twelve months ending Aug. 31, 1918. The returns thus far are being carefully studied by Fuel Administration accountants and engineers with a view to making the utmost saving to the public that is consistent with a maximum production of coal.

The order will have no effect on the price of anthracite coal, which forms the bulk of the domestic consumption fuel in the eastern part of the country.

Consumers of bituminous coal who have already entered their orders for the year's coal supply, but whose coal has not yet been delivered, will, of course, receive their supplies at the reduced price. The new price applies to all bituminous coal which left the mines after 7 a.m., on May 25, no matter how long the order for the delivery of the coal has been standing.

Coal delivered after 7 a.m., May 25, under contracts which have been entered into since Dec. 29, 1917, will be billed at the new price. Under the regulation of the Fuel Administration all such contracts call for the delivery of coal at the government price effective at the time of delivery.

Higher Rates to Make for Fare Box Business

Makers Are Preparing for a Heavy Demand—Substituting Metal Tokens for Paper

With the change of car fare, from 5 to 6 cents, already granted to a number of traction roads in Connecticut, Pennsylvania, Massachusetts and the Middle Western States, manufacturers of fare boxes are arranging their plants to meet the demand for a device to care for the new fare.

Where a nickel has been the uniform fare heretofore and to avoid an accumulation of pennies in the boxes, the token or metal coin, instead of paper tickets is to be substituted in many cases, according to the fare box manufacturers and distributers. It is believed the sale of fare boxes to accommodate the 6 cent or higher fare can be taken care of more conveniently and easily than in any other way by the use of metal tokens. In the Middle West the metal token or special coin has been adopted in a number of places and is highly popular. It is said these tokens occasionally are used as currency in local transactions.

The boxes now being used separate, register, and count four different fares automatically, the counting device being operated by a cam mechanism.

The Cleveland (Ohio) Armature Works, Inc., has filed articles of incorporation, under the laws of the State of Delaware with a capital stock of $2,000,000, to manufacture electric machines, generators and batteries. The incorporators are C. L. Rimlinger, M. M. Clancy and F. A. Armstrong of Wilmington, Del.

Wire Unaffected Because of Rubber Import Restrictions

Electrical Manufacturers Consulted in Advance of Order Limiting Incoming Crude Materials Supply

An order from the War Trade Board limiting the importation of crude rubber from overseas to a total of 25,000 tons from May 6 to July 31 is apparently not creating any discernible disturbance or concern with electrical goods manufacturers using this material in their finished products. Several leading producers of rubber-covered wire and cable, rubber insulators, etc., when asked if this action would curtail their output or have a tendency to increase prices, said that with the exception of rubber insulators, due to be advanced any day, no trouble was anticipated unless the restricted period was extended longer or indefinitely. Then there would be reason for anxiety.

Wire and cable manufacturers frankly state that rubber had been plentiful and cheap, and every company of any standing had certainly a three months' or more reserve stock of crude rubber on hand. In fact, it is reported that electrical goods producers had been consulted by the government regarding their supply of rubber before the action was taken. Therefore no one would be hampered or have legitimate or trade output lessened in any measurable degree.

The War Board stated in its notification that the "requirements for the production of goods for the United States and allied governments will be met in full. The remainder of the 25,000 tons permitted under the restriction will be allocated among the manufacturers of rubber products on the basis of their consumption in 1917."

Crude-rubber importers, on the contrary, are in a different frame of mind. A leading concern that has important dealings in crude rubber with the electrical trade was very much perturbed over the situation. The War Trade Board had sent out a questionnaire to the 175 importers of crude rubber, to which 174 responded. It was thus ascertained that on March 31 there were on order or in store 11,224 tons; engaged abroad or en route, 20,754 tons, with a further lot of 14,800 owned by Americans and intended for this market, making a total of 46,778 tons. It was further stated by this importer, who seemed to represent the sentiment of his branch of the business, that the annual (1917) consumption of crude rubber in this country was 169,000 tons. He therefore figured that the 46,000 odd tons in sight in no way could supply the normal demand.

The price of crude rubber established by the government on May 8 is 68 cents a pound for upper refined, 63 cents a pound for first latex (first milk), 62 cents a pound for red smoke sheets. The producers of electrical goods use all three grades in liberal quantities. Seven years ago Para rubber sold for $3.85 a pound.

Trade Notes

W. E. Hawley, formerly connected with the George Cutter Company, South Bend, Ind., in the switchboard department, is now with the Penn Electrical & Manufacturing Company, Irwin, Pa., manufacturer of switchboards and panelboards.

Safety Car Devices Company, St. Louis, has received an order for ten of its safety control equipments from the Charleston Consolidated Railway & Lighting Company, Charleston, S. C. These equipments will be used on the ten safety cars of thirty-five-passenger capacity, mentioned in the "Rolling Stock" column of the issue of this paper for May 18.

Heywood Brothers & Wakefield Company, Wakefield, Mass., manufacturer of car seats, chairs and fittings, in recently declaring an extra 5 per cent dividend on its common stock, made payment in Liberty Loan bonds of the third issue. The arrangement appears to have been very satisfactory to the stockholders. This was in addition to the regular 8 per cent dividend on the common.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has received an order from the United Electric Light & Power Company of New York City for a 22,000-kw. turbo-generator set. The generator will be rated at 25,900 kva. at 85 per cent power factor, 8000 volts, three-phase, 62½ cycles. It will be direct connected to a Westinghouse 22,000-kw. turbine. The order includes a 40,000 sq. ft. surface condenser and the usual auxiliaries.

Crouse-Hinds Company, Syracuse, N. Y., has placed on the market a dust and moisture proof cover for double push-button switches. These covers with the switch operating mechanism attached can be installed on either their FS or FD series condulets. This makes possible the use of this switch for lighting subways or platforms where dampness and dust prevail. Complete description of these covers is given in condulet bulletin No. 1000-H, which has just been published by this company.

New Advertising Literature

Combustion Engineering Corporation, New York, N. Y.: Bulletin C1, illustrating various installations of the method and operation of the "Cover Stoker," the title of the pamphlet.

Laclede-Christy Clay Products Company, St. Louis, Mo.: High-capacity stokers for higher volatile coals are described in a booklet. The operation of these is given.

Delta Star Electric Company, Chicago, Ill.: Bulletin No. 33, devoted to high-tension switching and protective equipment. This sixty-four-page bulletin has 309 illustrations and contains considerable technical information. Copies will be sent upon request.

Rolling Stock

Levis County Railway, Levis, Quebec, Canada, is reconstructing two double-truck cars.

Boston (Mass.) Elevated Railway's bill providing for the State taking over the property has been signed by the Governor and the order for 300 new cars will probably be placed soon.

Bamberger Electric Railroad, Salt Lake City, Utah, which had twenty passenger cars and several electric locomotives destroyed by fire on May 7, as reported in last week's issue, is arranging to buy new rolling stock deliverable as soon as possible. In the meantime second-hand cars are being secured to supply the deficiency.

Philadelphia (Pa.) Rapid Transit Company has put in operation, on its Hog Island shipyard branch, a type of car of the most advanced construction, which differs materially from the company's standard equipment. These 100 cars, the order for which came through the United States Shipping Board, Emergency Fleet Corporation, were built by the J. G. Brill Company and are now about nearly all delivered. At the time the contract was placed with the Brill Company specifications on an additional 100 were requested, on an option of thirty days. The option was not taken up, therefore current reports of the original order being expanded to 200 cars are without authority.

NEW YORK METAL MARKET PRICES

	May 22	May 29
Copper, ingots, cents per lb	23¼	23¼
Copper wire base, cents per lb	26¼ to 26¾	26¼ to 26¾
Lead, cents per lb	7 05	7 65
Nickel, cents per lb	40	40
Spelter, cents per lb	7½	7½
Tin, Chinese,* cents per lb	$1.03	$1.00
Aluminum, 98 to 99 per cent., cents per lb	†32.10	†32.10

* No Straits offering. † Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	May 22	May 29
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	19
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6	6
Zinc, cents per lb	5¼	*12
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$50.00	$60.00
Machine shop turnings, Chicago, net ton	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	May 22	May 29
Rubber-covered wire base, New York, cents per lb	27 to 30	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	30.40 to 36.10	30½ to 36.10
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	38.00 to 38.35
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 100 to 500-ton lots, per gross ton	$65.00	$67.50
T-rails, high (Shanghai), cents per lb	4½	4½
Rails, girder (grooved), cents per lb	4½	4½
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	‖	‖
Tie plates (flat type), cents per lb	*3½	*3½
Tie plates (brace type), cents per lb	*3½	*3½
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3½	*3½
Angle plates, cents per lb	*3½	*3½
Angle bars, cents per lb	*3½	*3½
Rail bolts and nuts, Pittsburgh base, cents per lb	4 90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5 80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount†	80%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount	80%	80%
Car window glass (double strength, all sizes AA quality), New York discount	82½ & 3%	82 & 3%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13¾	13 to 13¾
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.60	$42.00
Asphalt filler, per ton	$45.00	$45.00
Cement (truck lots), New York, per bbl	$3.20	$3.20
Cement (carload lots), Chicago, per bbl	$3.26	$3.26
Cement (carload lots), Seattle, per bbl	$3.60	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.58	$1.58
White lead (100 lb. keg), New York, cents per lb	9	10
Turpentine (bbl. lots), New York, cents per gal	51½	53

* Government price. † These prices are f.o.b. wharves, with boxing charges extra.



Peacock Brakes

Are Standard
In Seven-Hilled Richmond

When Richmond, Norfolk and other lines of the Virginia Railway & Power Company get cars, the Peacock Brake is on them. Today about 250 are in service.

It's in Richmond, especially, that the Peacock Brake's superiority counts, for Richmond is a city of hills with railway grades up to 8 per cent.

The Peacocks in the easier gradient service are tested out every round trip; those on hard lines, every half trip.

The fact that the Peacock releases *gradually* is a mighty important factor in safe operation down the grades because it *prevents complete loss of braking power.*

And the fact that Richmond's last winter saw more than a dozen cars at a time laid up from frozen air, is another good reason for using the simple Peacock Brake.



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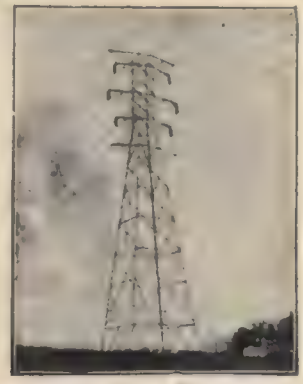
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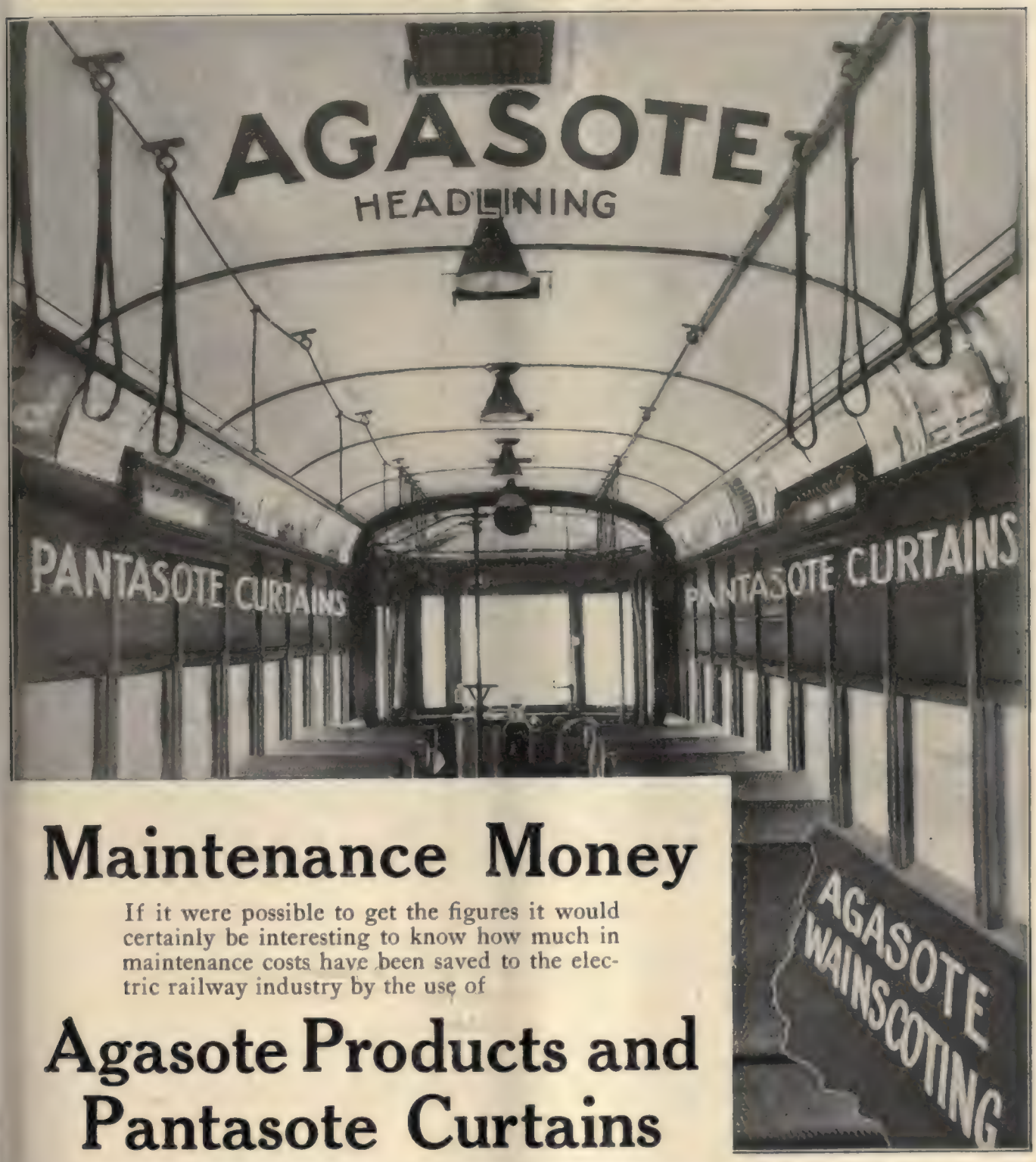
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The publicity which surrounds each transaction is such that irregularities on the part of both passenger and conductor are reduced to a minimum. If there *are* any irregularities, they are soon understood through the method of merit analysis made possible by the Ohmer System and the proper discipline can be applied.

The Ohmer System consists of the most successful ideas of modern business applied to the conservation of the receipts of electric railways.

OHMER FARE REGISTER COMPANY

DAYTON, OHIO



Maintenance Money

If it were possible to get the figures it would certainly be interesting to know how much in maintenance costs have been saved to the electric railway industry by the use of

Agasote Products and Pantasote Curtains

It would surely total up to a very tidy sum.

The old style wooden roof with its covering of white lead and canvas had to be repaired at intervals to keep it waterproof.

In event of accident repairs were a tedious and costly process.

AGASOTE is absolutely waterproof to start with and it stays that way.

In event of accident it is *easily* and *rapidly* patched.

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PANTASOTE CURTAINS have only to be washed to be as good as new.

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Around the Continent With Hale and Kilburn



At Richmond on Center-Entrance Cars

The fine center-entrance cars used in city and suburban service at Richmond, by the Virginia Railway and Power Company, are justly admired for their handsome outlines and comfortable interiors. It is hardly surprising, therefore, to find that Hale and Kilburn seats are in all of these cars—and that they have proved well adapted to the up-hill and down-dale speeds and service in this city, famous for both its hills and its history!

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More than four years ago the Southern Public Utilities Company, Charlotte, N. C., began to use Boyerized Brake Pins and Bushings.

Charlotte cars make 45,000 to 48,000 miles a year at a schedule speed of 9.5 m.p.h.

That means nearly 200,000 miles of service.

Yet not one Boyerized Pin has been removed for wear!

If it's safety and economy you are after, Boyerize!

ELECTRIC RAILWAY SUPPLIES

Bemis Car Truck Company

SPRINGFIELD MASS



The Wonderful Single-Service Chilled-Iron Wheel

Standard for 67 Years

The Chilled Iron Wheel has performed its every function at a minimum cost.

For Freight Cars

95% of all cars in this type of service are carried on Chilled Iron Wheels.

For Street Cars

The Chilled Iron Wheel is Standard for Street Car Service in 95 out of 100 cities in the United States and Canada, operating 100 cars or over.

The Conclusion

to be gained from these figures is that the Chilled Iron Wheel gives the Greatest Service for the Lowest Cost.

Association of Manufacturers of Chilled Car Wheels
1229 McCormick Building, Chicago, Ill.

Representing Forty-eight Wheel Foundries Throughout the United States and Canada. Capacity 20,000 Chilled Iron Wheels per Day.



American Business—Attention!

The First of Every Month

will be observed as

Thrift Stamp Day In The U. S. A.

The first Thrift Stamp Day went over big! It proved a tremendous boost for Uncle Sam's Thrift Stamps and War Savings Stamps campaign and for American business in general. As a result of the great success of the first Thrift Stamp Day it has been decided to make the First Day of every month Thrift Stamp Day in the U. S. A.!

This means that every branch of American business has the unusual opportunity to make the first of every month a **red letter business day** throughout the Nation, and a **Victory day for the U. S. Government** by disposing of hundreds of thousands of dollars' worth of Thrift Stamps and War Savings Stamps!

So get busy at once in preparation for these red letter business days—these monthly Thrift Stamp Days! Manufacturers, jobbers, wholesalers, retailers, get together and plan for special Thrift Stamp Day sales, unusual values in every line of merchandise and commodity. It's up to you to help the Government and help yourselves at the same time.

Profit by your experiences of the first Thrift Stamp Day to make the succeeding Thrift Stamp Days still more of a success! Redouble your former efforts and you'll double the results! If any of you should still be unfamiliar with the working plant for Thrift Stamp Day, write for this plan **today without fail.** Address W. Ward Smith, National War Savings Committee, 51 Chambers St., New York City.

W.S.S. WAR SAVINGS STAMPS ISSUED BY THE UNITED STATES GOVERNMENT

National War Savings Committee

51 Chambers Street, New York City

W.S.S. WAR SAVINGS STAMPS ISSUED BY THE UNITED STATES GOVERNMENT

DU PONT AMERICAN INDUSTRIES

Reduce Maintenance Costs

By Adopting Quicker, Cheaper and Labor-Saving Methods

With the track and construction crews reduced by the country's call, every labor-saving agency must be employed to enable the work of track-repairing and extension to be accomplished with the remainder of the force.



By the Use of Red Cross Explosives

to blast earth, shale and gravel ahead of graders and steam-shovels; to demolish culverts, piers, log and ice-jams; improve drainage conditions; prepare pole and post holes; shatter stumps and boulders, it will be found that Red Cross Explosives are actual labor savers in a very practical manner.

Lower Your Expenses

by adoption of labor-saving methods based on the extensive experiences of our field forces while investigating the blasting operations required to construct the nation's railways. Tell us your blasting problems —let us help you to reduce your maintenance costs.

E. I. du Pont de Nemours & Co.
Wilmington, Delaware

NOTE: When in Atlantic City, visit Du Pont Products Store, Boardwalk and Penn. Avenue.

The Du Pont American Industries Are:

E. I. du Pont de Nemours & Co., Wilmington, Del., Explosives.
Du Pont Chemical Works, New York, Pyroxylin and Coal Tar Chemicals.
Du Pont Fabrikoid Co., Wilmington, Del., Leather Substitutes.
The Arlington Works, 725 Broadway, New York, Ivory Py-ra-lin and Cleanable Collars.
Harrison Works, Phila., Pa., Paints, Pigments, Acids, Chemicals.
Du Pont Dye Works, Wilmington, Del., Dyes and Dye Bases.

MAIL THIS COUPON — Mark X before subject of interest and send with address to Adv. Div. E. I. du Pont de Nemours & Co., Wilmington, Delaware. (El. Ry. Jnl.)

☐ Explosives	☐ Varnish	☐ FABRIKOID
☐ Blstg. Powder	☐ Com'l Acids	☐ Auto Top M't'l
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☐ Trapshooting	☐ Dyes & Bases	☐ Tar Distillates
☐ Paints	☐ Bridgeport Wood Finish	☐ Ref'd Fusel Oil
☐ Enamels		

DU PONT



FRANKLIN
Bus Bar Supports

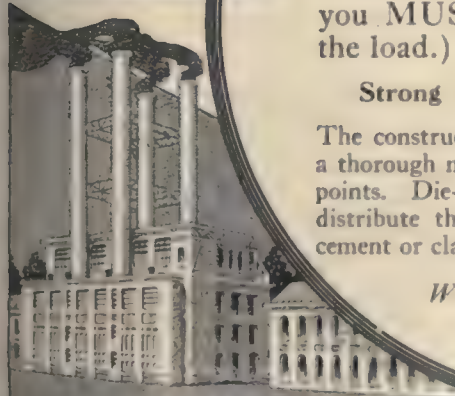
INSTALL THE "FRANKLIN" AND FORGET IT! — ELECTRICAL DEVELOPMENT AND MACHINE CO. — TRADE MARK — GENERATING STATION EQUIPMENT

are SAFE—PERMANENT—RELIABLE. They PROTECT the ONE VITAL POINT of the plant against breakdown. (No matter what happens, you MUST have bus bars to distribute the load.)

Strong Mechanically and Electrically

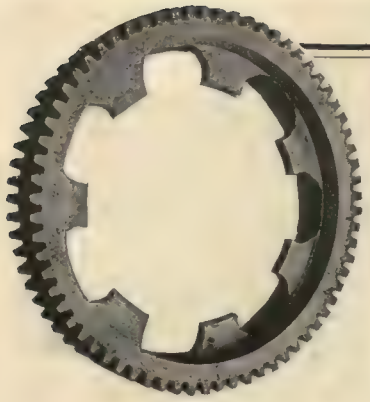
The construction of Franklin Bus Bar Supports is a thorough mechanical job. There are no flashover points. Die-cast metal bushings, threaded by lathe, distribute the mechanical stresses uniformly. No cement or clamps are used—no split fittings.

Write for illustrated bulletin.





SELLING AGENTS
The Philadelphia Electric Company Supply Department
132 South Eleventh Street, Philadelphia, Pa.



RELIABILITY

Reliable operation and continuous service are the two most important factors in electric railway operation.

Because of the great importance of these points, all Baldwin-Westinghouse Electric Locomotives are equipped with BP treated gears and pinions.

Reliability brings about saving and satisfaction. Prove it for yourself on your own rolling stock.

NUTTALL
PITTSBURGH



You Can Minimize Overhead Repair Work

and successfully cut maintenance costs if you turn to

The Macallen Line

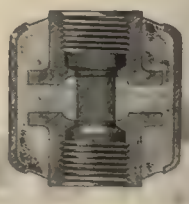
of strain insulators, hangers, splicing ears, crossings, and other overhead material.

They are "specialty" products, designed and built to make "Macallen" the standard on American railways.

It will pay you to write for information and prices.



The Macallen Insulating Joint



Adopted by principal air brake manufacturers as part of their standard equipment. Also insulates steam pipes, etc. Shell is seamless drawn steel, nipples are machined from steel rod, and insulating material is Macallen Vulcanite Compound, not affected by heat or oil—practically indestructible.

May We Send Our Catalog?

TRADE MACALLEN MARK.

The Macallen Company

Macallen and Foundry Sts., Boston

TRADE MACALLEN MARK.

Controller Contact Fingers



are made of hard-drawn or drop forged copper, while the springs are stamped from special alloyed rolled phosphor bronze sheet. Standard parts are shipped from stock; special sizes or shapes made to order.



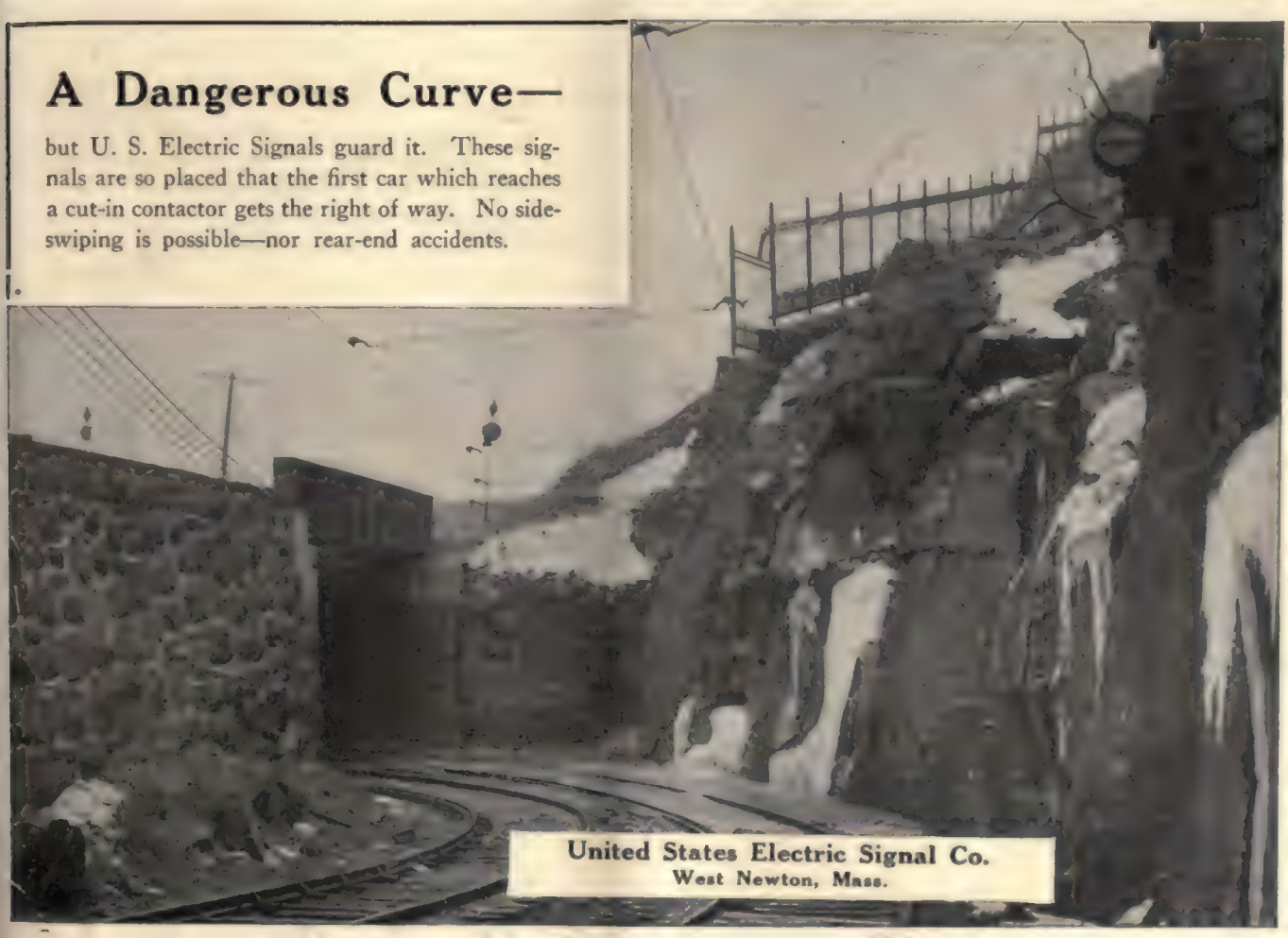
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North East, Pa.

The Eureka Co.

A Dangerous Curve—

but U. S. Electric Signals guard it. These signals are so placed that the first car which reaches a cut-in contactor gets the right of way. No side-swiping is possible—nor rear-end accidents.



United States Electric Signal Co.
West Newton, Mass.

"RIMCO"



RUBBER INSULATED PLIERS

safeguard employer against liability suits; safeguard employee against loss of life.

Tested and guaranteed to 10,000 volts. Semi-soft rubber handles are firmly bonded to the pliers by the only known process—the Elchemco. Cannot break when dropped. Safe, durable, economical. An asset to any individual or company.

Write for full particulars.

The Rubber Insulated Metals Corp., Plainfield, N. J.

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Exclusive Export Agents

Western Electric Company
INCORPORATED

Fewer Wire Repairs at Crossings

There will be less destructive hammering and fewer repairs at the crossings if you install



ANDERSON
Cross-Over

The Anderson Cross-Over

Carefully designed and proportioned to eliminate flaring arcs and wheel trouble. Used by prominent railway companies at a big saving in upkeep. Let us give you the full details.

Write for catalog No. 8 now.

The Anderson Trolley Wheel

Flexible approach ears prevents pounding when wheel takes the crossing.

Albert & J. M. Anderson Mfg. Co.

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When You Specify Lumber for

CROSSARMS, TIES,

FENCING, TRUNKING AND CAPPING or any of the hundred and one things that a railway uses lumber for, just bear this important fact in mind:

The cost of the material is generally a small item as compared with the cost of labor for installing it.

When you specify and use ALL-HEART

CYPRESS

"THE WOOD ETERNAL"

for such purposes you know that it is going to give service for a long time, and that you are *not* going to be up against a continuous big *labor cost* for renewals and replacements.

Of course even Cypress may eventually have to be replaced. Nothing lasts quite forever. But in the long service life you get from Cypress you will have *saved* a lot of labor costs in *maintenance alone.*

Anyway, that's why a number of the biggest railways in the country *insist* on ALL-HEART CYPRESS.

"BUY BY THE CYPRESS ARROW." LOOK FOR THIS MARK ON THE END OF EVERY BOARD—AND ON EVERY BUNDLE.

Our data is at your service.

SOUTHERN CYPRESS MFR'S ASS'N.

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Yale Spur-geared Blocks handling Plates in Shipyard



"Speeding up" —and Yale Spur-geared Blocks

Everywhere the great national cry is speed—speed—speed. Ships, aeroplanes, guns, munitions—all demand haste. *They must have priority.*

Yale Spur-geared Blocks are helping build Uncle Sam's great Merchant Fleet. They are part of the equipment of every vessel where safe, dependable hoisting apparatus must be ready for every emergency.

No ship's equipment is complete that does not include Yale Hoists to handle any load—light or heavy.

Yale Spur-geared Blocks are designed, built and tested on the basis of quality: to stand the 50% overload test of 3360 lb. to the rated ton. The guarantee is in the block itself.

For Sale by Machinery Supply Houses

Put your hoisting problems up to us

Ask for New Catalog

For factory locking equipment use a Yale Master-key System. Write us for particulars.

The Yale & Towne Mfg. Co.
9 East 40th Street
New York

The Yale Spur-geared Block





This is the bond that when welded to your rail joint shows a saving of 25-35 cents per bond. We prove this saving over any other method.

THE Lincoln Bonding Machine is a traveling repair shop. Under present conditions worn and broken parts have to be used until new parts can be received.

The quickest and simplest way is by the use of a Lincoln Bonding Machine.

Any and all kinds of metallic and carbon welding made easy.

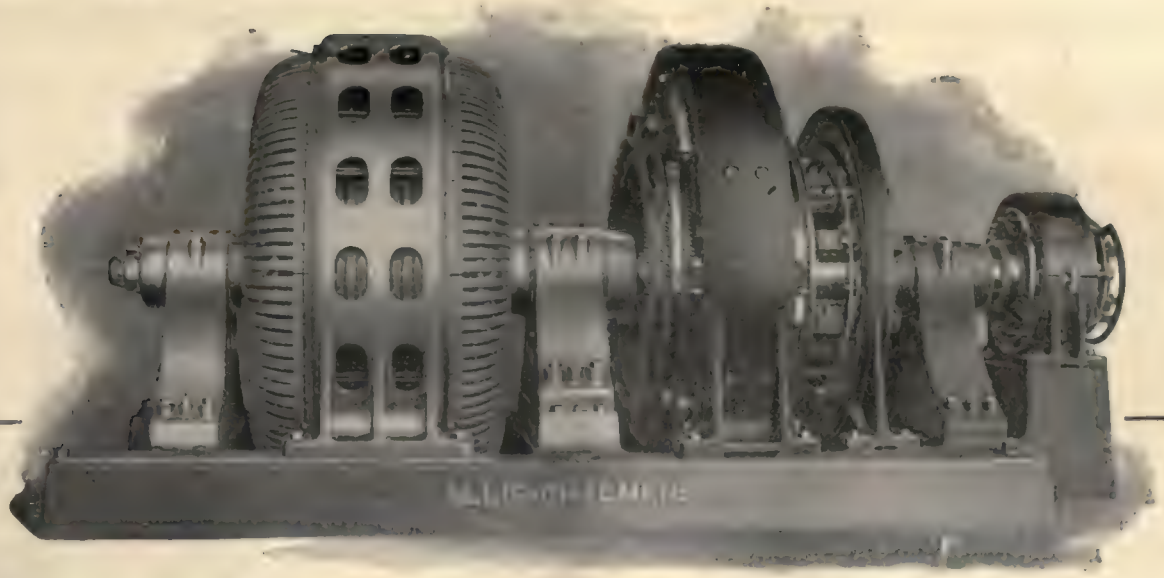
The Lincoln Bonding Machine is the lightest and most efficient machine today.

THE LINCOLN BONDING CO.

636 Huron Road, Cleveland, Ohio

AGENTS: Boston, Charles N. Wood Co. New York, Atlantic Welding Co. Philadelphia, Railway Track-Work Co. Pittsburgh, Electrical Engineering & Manufacturing Co. Chicago, Holden & White, Inc. St. Louis, W. L. Rose Equip. Co. Milwaukee, W. C. Burdick. Los Angeles, Wigmore, Hall & Co. Canada, Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Winnipeg.





Important Railway Systems—

Street and Interurban Railways—Public Service Corporations—Municipal and Industrial Plants—Mining and Smelting Companies—and Numerous Other Industries.

Are Using Allis-Chalmers Motor-Generators.

These sets are in daily operation and are giving reliable, efficient service.

Our Bulletins show many such installations. Our District Offices will be glad to point out those in your vicinity.

Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

DISTRICT OFFICES IN ALL LARGE CITIES

Canadian Representatives: Canadian Allis-Chalmers, Ltd., Toronto, Ont.

Where electrical safety is vitally important

Aboard Uncle Sam's battleships too stringent care cannot be taken to prevent overloads and short circuits reaching the electrical equipment. This is effectively safeguarded against by the use of

ECONOMY renewable FUSES

No one can question for a moment that safety is the first consideration in the fusing of these circuits. What greater assurance could be offered of the accuracy and all-around dependability of Economy Fuses.

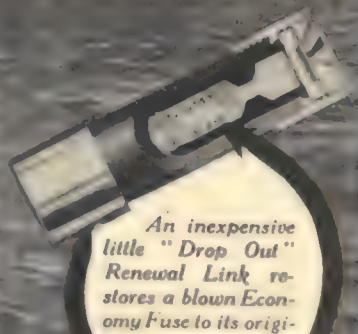
Now weigh the fact that ECONOMY renewable FUSES and "Drop Out" Renewal Links cut annual fuse maintenance costs 80 per cent. A single order recently shipped to one Navy yard saved the Government over $76,800.00. Smaller users enjoy the same proportionate saving.

Order from your electrical dealer. Write for Catalog 17.

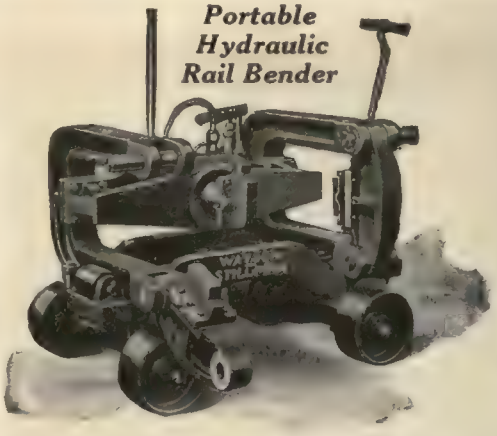
ECONOMY FUSE & MFG. CO.

Kinzie and Orleans Streets, CHICAGO, U. S. A.

Sole Manufacturers of "ARKLESS"—the Non-Renewable Fuse with the "100% Guaranteed Indicator." Also made in Canada at Montreal.



An inexpensive little "Drop Out" Renewal Link restores a blown Economy Fuse to its original efficiency.



Portable Hydraulic Rail Bender

HYDRAULIC TOOLS *for* TRACK MAINTENANCE

We show here two of our line of tools for track use, built to withstand the rough handling of unskilled labor.

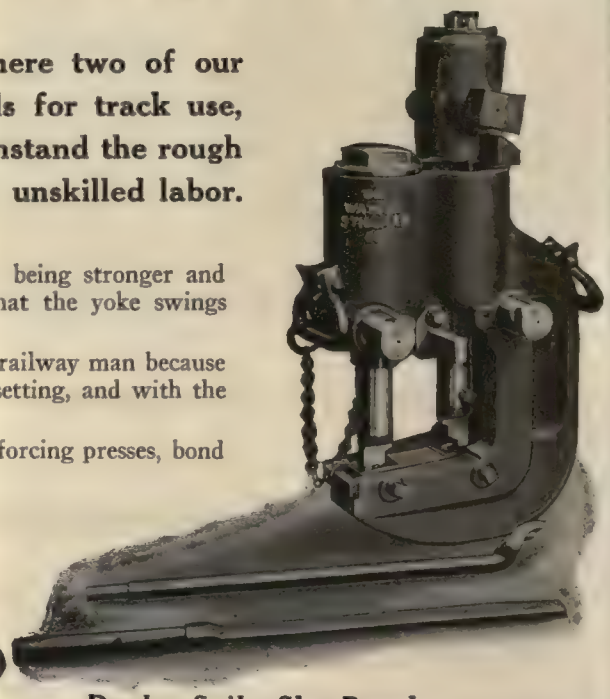
This rail bender is an improvement over similar forms, being stronger and equipped with formed bending blocks. It will be seen that the yoke swings back for the rail to be inserted sideways.

The spike slot punch shown below should interest every railway man because it will punch two holes on opposite sides of the rail at one setting, and with the same effort usually used to cut one.

Other labor-saving tools of our make are wheel presses, forcing presses, bond compressors, benders, straighteners, etc.

Write for Catalogs.

The Watson-Stillman Co.
46 Church St., New York
Engineers and Builders of Hydraulic Machinery
Chicago, McCormick Bldg.



Duplex Spike Slot Punch

319

We Make 100 Varieties of Ticket Punches But Only *One Quality*





and that is B-V Quality



Bonney-Vehslage Tool Co.
61 New Jersey R. R. Ave.
Newark, N. J.







Johns-Manville Fibre Conduit

Speeds Up Construction Without Lowering Standards

During war times it is a temptation—and occasionally, perhaps, even an economy—to sacrifice quality in order to speed up construction.

But you sacrifice neither quality nor economy nor speed when you specify Johns-Manville Fibre Conduit. In first cost, labor cost, and maintenance cost, it reduces every total on your expense sheet.

It makes a smooth, straight tube with no offset sections or knife edge cement drippings to score the lead sheath. Nor will there be any trouble later from electrolysis, because leak-proof joints and an exceptionally high dielectric strength keep out stray currents.

Johns-Manville Fibre Conduit, practically indestructible from natural causes, is light in weight, easy to handle, and cheap to lay. You will find our new Conduit Booklet interesting. Ask our nearest branch for it.

H. W. JOHNS-MANVILLE CO.
NEW YORK CITY
10 Factories—Branches in 61 Large Cities

JOHNS - MANVILLE Fibre Conduit

ROEBLING WIRES AND CABLES



Wire for Electric Railways

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY

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Cleveland Atlanta San Francisco Los Angeles Seattle Portland, Ore.

DU PONT AMERICAN INDUSTRIES

DU PONT FABRIKOID
REG. U. S. PAT. OFF.

Makes an Economical and Durable Car Seat Covering—

It costs less than the poorest leather and serves better than the best.



Interior of Center-Entrance Car for New Buffalo-Niagara Falls Line with Du Pont Fabrikoid seat upholstery.

Du Pont Fabrikoid is waterproof—grease-proof—stain-proof—and washable.
Du Pont Fabrikoid is uniform throughout and saves time, labor and waste in cutting.
Du Pont Fabrikoid is easily applied, attractive in appearance and sanitary.

We will send samples and prices on request.



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WILMINGTON, DEL. **NEW TORONTO, ONT.**
Wendell & MacDuffie Co.
Railroad Department Representatives: 61 Broadway, New York

DU PONT

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BROOK

Bound Brook Oil-less Bushings on trolley wheels have given as high as **27,600 Miles** of service. If **your** bushings show a record which is much lower — there is something wrong. Let us know **your** results and we will do our best to **improve** them. We sell **service** in addition to bearings.

"Bound Brook"
is a trademark which stands for the only Genuine Graphited Oil-less Bearings.

Across the Continent — Boston, Toronto, Rochester, Albany, Philadelphia, St. Louis, New York, Newark, Baltimore, Chicago, Spokane, practically every important system on the Pacific and Atlantic Coasts is bound to "Bound Brook" by the ties of superior service and the reason is **satisfaction.**

Genuine Graphited Oil-less Bearings.

Bound Brook Oil-less Bearing Co.

Formerly Graphite Lubricating Co.
Bound Brook, N. J.

Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Winnipeg



For Better Service

THE TAPE OF QUALITY

There are four good reasons why the sixteen

SHIELD QUALITY BRAND TAPES

are the best tapes. The Shield and the Seal stand for

Maximum

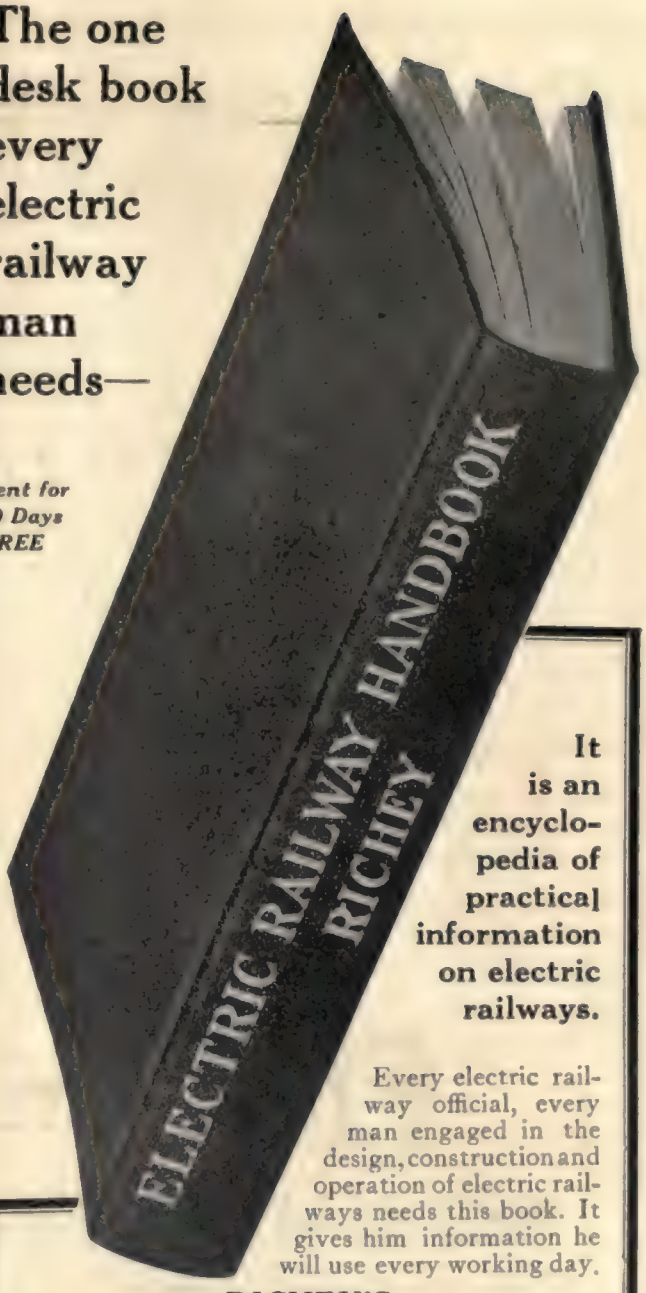
—Service
—Economy
—Efficiency
—Durability

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AND ASSOCIATED COMPANIES

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Mechanical Goods Division
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The one desk book every electric railway man needs—

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It is an encyclopedia of practical information on electric railways.

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RICHEY'S ELECTRIC RAILWAY HANDBOOK

832 pages, flexible binding, pocket size, 600 illustrations—$4.00 net, postpaid

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Better pleased patrons and better profits have always resulted from the installation of

RAILWAY ROLLER BEARINGS

Big savings in power are made by the decreased friction and the longer wasting periods that naturally follow.

Less oil is required by the inclosed dust-proof and oil-tight design which provides continuous lubrication without waste of oil.

Very easy to mount in your trucks and no trouble to inspect in service. No adjustments are required after installation.

Interesting city, suburban and interurban performance data is available. Shall we send it?



The Railway Roller Bearing Co.
Syracuse, New York

EMB Grid Resistors

ARE MADE RIGHT AND STAY RIGHT

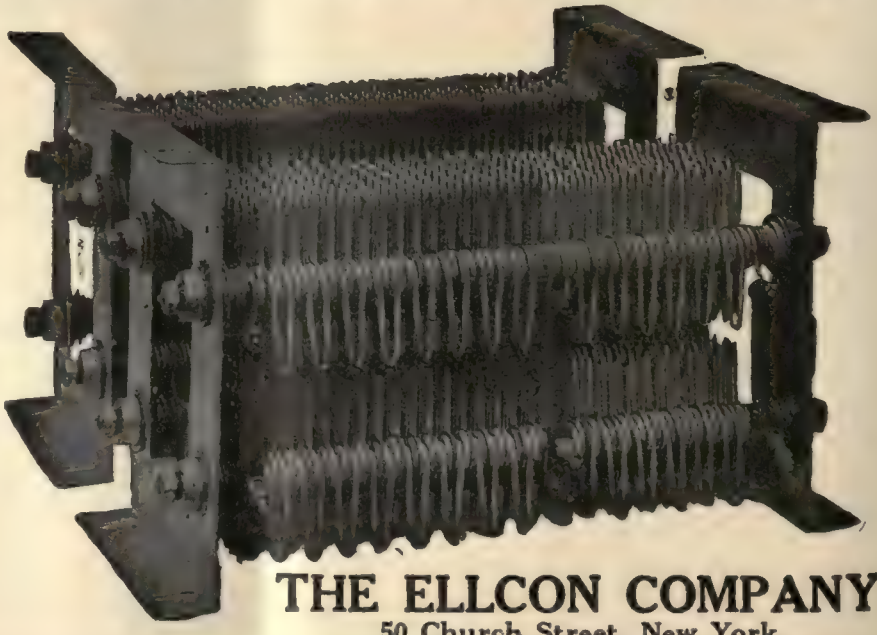
No resistors get more abuse than those under a car.

They are abused electrically by careless operation of the controller.

They are abused mechanically by exposure to dusty, muddy and stone-littered streets.

Until the arrival of E M B drawn, non-corroding grid resistors, troubles from these sources seemed unavoidable.

E M B grid resistors actually have made this part of your equipment troubleproof.



THE ELLCON COMPANY
50 Church Street, New York

"STANDARD"

Steel Tires — Steel Tired Wheels
Solid Rolled Steel Wheels
O. H. Steel and Malleable Iron Castings
Solid Forged Gear Blanks
Steel Forgings — Iron Forgings
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Steel Springs

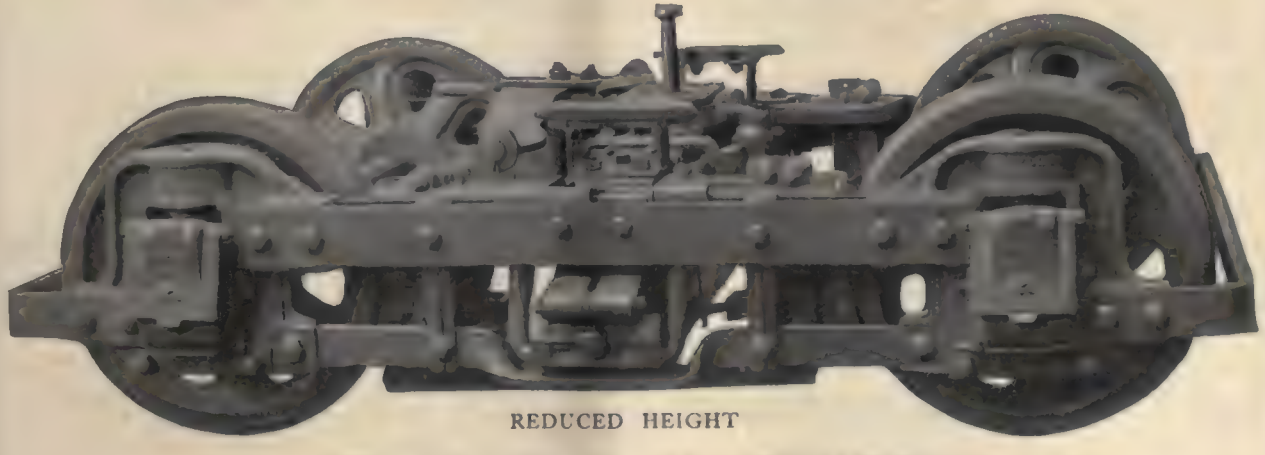
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R. H.
TAYLOR REDUCED HEIGHT TRUCK



REDUCED HEIGHT

TAYLOR R. H. TRUCK

Mounted on 26-Inch Wheels With Springs Over Journal Boxes
Designed to Mount Centre and End Entrance Cars Low Down

SWING MOTION AND FULL ELLIPTIC SPRINGS

Wheel Base 5 ft. 2 in. For Car Bodies weighing 16,000 to 22,000 lb. Motors Inside Hung.

EASY RIDING

Journals 3¾ x 7 M.C.B. Type. Height from Rail to Body Bolster, 22¾ in. Brakes Inside Hung.

TAYLOR ELECTRIC TRUCK CO., TROY, N.Y.

Established 1892

SPECIFICATIONS ON REQUEST — SEND FOR PORTFOLIO



You Are Never in Doubt

when your road is protected by

Nachod Signals

No matter what your road conditions are, a Nachod will take care of them. There are 7 types of Nachods for all service, from high speed interurban to city travel.

Write for information.

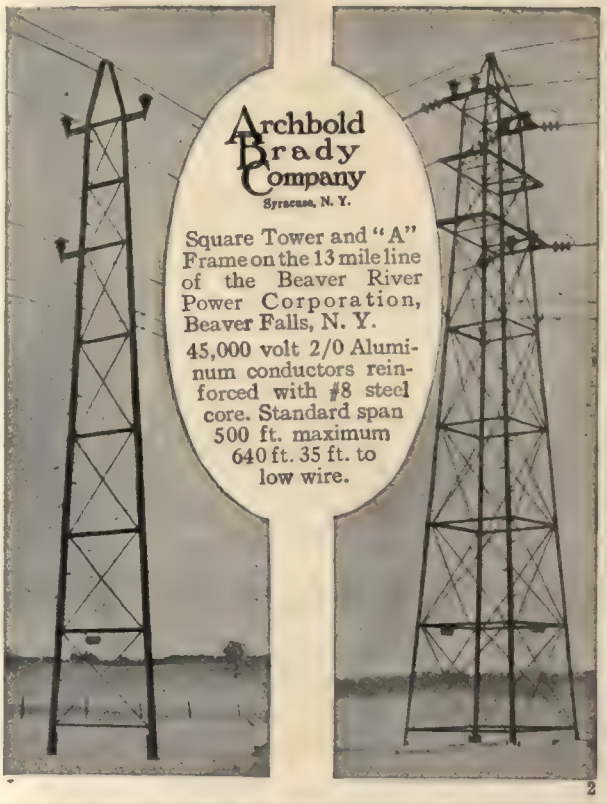
Nachod Spells Safety.

NACHOD SIGNAL CO., Inc.
Louisville, Ky.

PACIFIC COAST REPRESENTATIVES
BOCLES & SMITH CO., Portland, Oregon, San Francisco, Cal., Los Angeles, Cal.

2234

Modern Construction



2

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PITTSBURGH, PA.

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PAPER INSULATED UNDERGROUND CABLE
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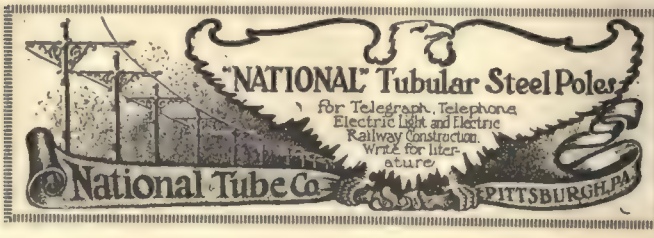
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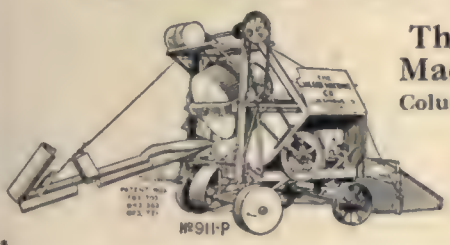
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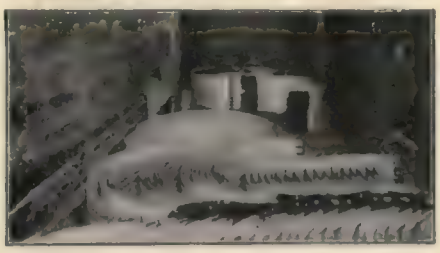
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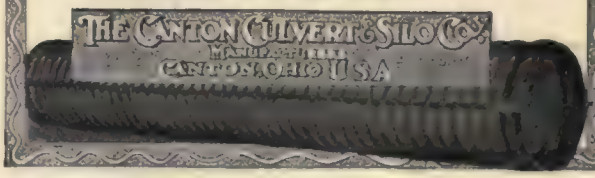
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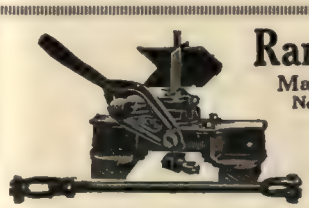
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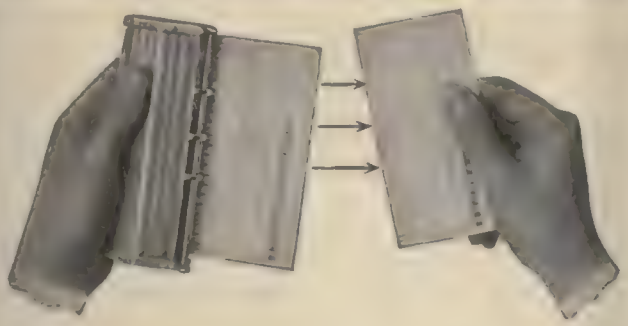
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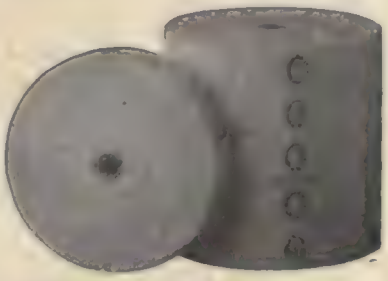
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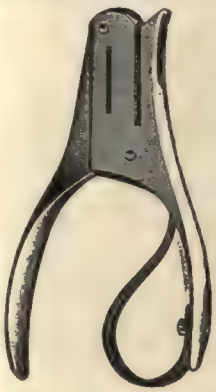
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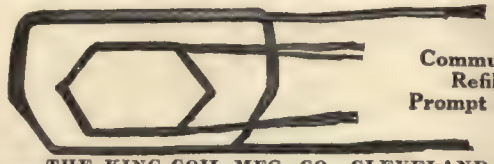
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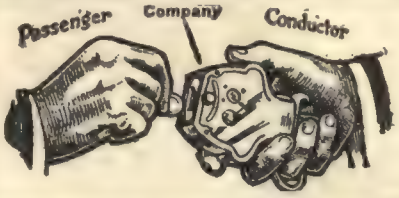
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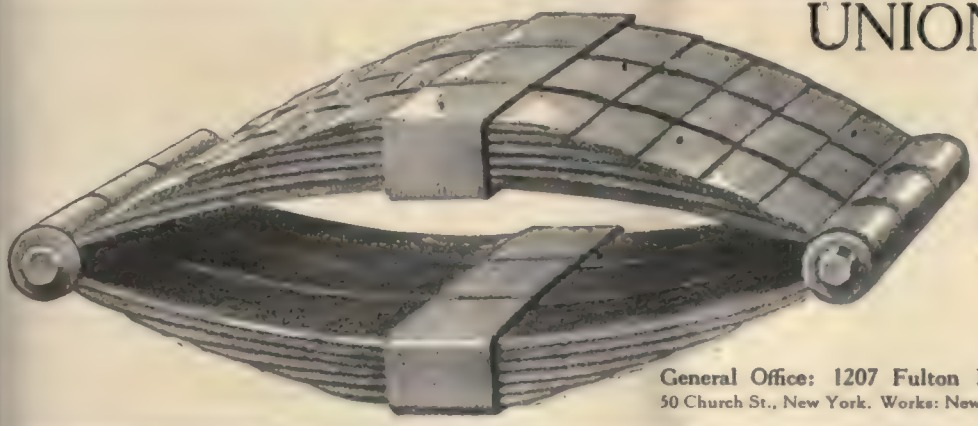


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114 Liberty St., New York, N. Y.

Complete Power Plant

Delivery Approx. May 1st

2—780 KVA Westg. Turbo Outfits, 3-ph. 60-cy., 2400-V., 3600 R.P.M., complete with switchboards and exciter units; also condensing apparatus. 4-338 H.P. Keeler Water Tube Boilers with breeching, stack, pumps.

TURBINES

1—2500 KVA. Gen. Elec. Curtis Horz. Turbo Outfit, 2-phy., 60-cy., 2300-V., 3600 R.P.M., 150-lb. steam pressure, with Westg. Le Blanc Condenser.
1—500 Kw. Gen. Elec. Curtiss Turbo Outfit, 3-ph., 60-cy., 2300-V., 1800 R.P.M., 150-lb. steam pressure. Vert. type.
1—500 Kw. Westg. Horz., 3-ph., 60-cy., 360-V., 3600 R.P.M. Turbo Outfit.
1—100 Kw., Gen. Elec. Turbo Outfit, 3-ph., 60-cy., 2300-V., 3600 R.P.M., 125-lb. steam pressure.

ARCHER & BALDWIN, Inc.
114-118 Liberty St., New York, N.Y. Telephone 4337-4338 Rector

WANTED

ONE CAR WHEEL BORING MACHINE

Boring wheels 36 in. in diameter maximum.
Either belted or motor driven.

The Hagerstown & Frederick Ry. Co.
Frederick, Md.

FOR SALE

Ten sets United States Signal Company

BLOCK SIGNALS

with semaphores in excellent operating condition.

Good opportunity for small road to obtain block signals at reasonable price.

HOLYOKE STREET RAILWAY CO.
Holyoke, Mass.

FOR SALE

4—Westinghouse 38-B, 50-hp. Motors complete, with 18-tooth pinions.
2—Gears, 64 teeth, 4-in. bore, split type, 4 spoke.
6—Gear cases (2 new), for gear ratio 18/64.
2—Westinghouse K-14 controllers.
6—Westinghouse platform controllers.

All of this material in very good shape, subject to inspection. Stores Department,

MONONGAHELA VALLEY TRACTION CO.
Parkersburg, West Virginia

THE SEARCHLIGHT SECTION

will locate the Man you want / Position you want / Equipment you want

Are you using the Searchlight?

Railroad and Tram Car Specialties

New inventions developed, perfected and worked for the English market

Messrs. G. D. Peters & Co., Ltd.
Moorgate Works, Moorfields, LONDON, E. C.

SEARCHLIGHT SECTION

FOR SALE

1—Rice & Sargent Cross Compound

ENGINE

complete with condenser, direct connected to 360 kw. General Electric

GENERATOR

Specifications of Engine:
High pressure cylinder 16 in. bore.
Low pressure cylinder 32 in. bore.
Stroke 42 in. Revolutions 120.

Specifications of Generator:
General Electric 360 kw.
525 volts, direct current.
Serial No. 53907, type MP.
Form H., class 8.
Amperes 688,
Volts 500, no load; Volts 525, full load.

This generating is set in first-class condition and ready for immediate shipment. *Will be sold at a very reasonable figure.* Outfit may be seen at our Ansonia plant.

FARREL FOUNDRY & MACHINE CO.
Ansonia, Conn.

FOR SALE

Turbine Generator

Vertical type Curtis steam turbine generator, 500-kw. capacity, 1800-r.p.m., full load, voltage 4000, complete with switchboard, condensing apparatus and piping.

THE COLUMBUS RY., PR. & LT. COMPANY
14 N. High Street, Columbus, Ohio

Rails

100 tons 7 in., 70 lb., Shanghai Relayers.
125 tons 9 in., 90 lb. Girder Rails.
500 tons 60 lb. A.S.C.E. with angles. New.
150 tons 65 lb. A.S.C.E. with angles. New.
200 tons 100 lb., with angles. New.
Full Stock, All Weights.

Interurban Cars

1—Combination, 38 ft. over platforms, 28 ft. inside. Passenger compartment 20 ft., baggage compartment 8 ft., seating capacity 36. Four G. E.-1000 motors. Double end control.

1—Passenger, 38 ft. over platforms, seating capacity 42. Two G. E.-1200 motors. Double end control.

Both in First-Class Condition.

ZELNICKER IN ST. LOUIS

GET BULLETIN 237—70 BARGAIN PAGES.

Get your Wants into the Searchlight

ADVERTISING RATES

Ads Set in Uniform Style

(Solid, in one paragraph, without display.)

THREE CENTS A WORD, minimum charge 50 cents an insertion, payable in advance, less 10 per cent if one payment is made in advance for four continuous insertions—for advertisements under:

Positions Wanted	Vacation Work Wanted
Evening Work Wanted	Tutoring
	Salesman Wants Connections

FIVE CENTS A WORD, minimum charge $1.50 an insertion, for advertisement under:

Agencies Wanted	Positions Vacant
Agents Wanted	Partner Wanted
Business Opportunities	Representations Wanted
Desk Room for Rent	Salesmen Wanted
Educational	Patents for Sale
Employment Agencies	Plants for Sale
Desk Room Wanted	Sub-Contracts Wanted
Foreign Business	Work Wanted

Miscellaneous for Sale, for Rent or Want Ads.

THIRTY CENTS A LINE, minimum five lines, for all undisplayed advertisements set with a paragraph for each item or tabulated.

THREE DOLLARS AND SIXTY CENTS AN INCH for advertisements for bids (Official Proposals).

Ads Set in Display Type

(Individual space, within border rules.)

Space for these advertisements is sold by the inch. Each page contains 27 inches. The rate per inch is based on the *total* number of inches to be used—that is, the number of inches the advertisement is to occupy multiplied by the number of insertions it is to receive. For instance, a 2-inch advertisement in 2 issues earns the 4-inch rate of $3.90 an inch. A 1-inch space in 4 issues, or a 4-inch space in one issue, also earn the 4-inch rate.

SCHEDULE OF RATES

1 to 3 in., $3.00 an in.	15 to 26 in., $2.70 an in.
4 to 7 in., 2.90 an in.	27 to 49 in., 2.60 an in.
8 to 14 in., 2.80 an in.	50 to 99 in., 2.55 an in.

Rates for larger space furnished on request.

INFORMATION

ALLOW FIVE WORDS for the address, if replies are to a box number in care of any of our offices. There is no extra charge for forwarding replies.

IN REPLYING TO ADS. do not enclose original testimonials or anything that you may want returned. State your experience and qualifications in as concise and neat a manner as possible and enclose copies of your testimonials.

BE CAREFUL TO PUT ON ENVELOPE, when answering any "blind" ad, the box number in the ad, the name of the paper, and also the local address of office to which reply is sent:

30th St., at 10th Ave.,	New York
1570 Old Colony Bldg.,	Chicago
657 Leader-News Bldg.,	Cleveland
925 Real Estate Trust Bldg.,	Philadelphia
501 Rialto Bldg.,	San Francisco

WHEN ADVERTISING MACHINERY, use your own name and address—or a local address of some kind—so that the readers can wire direct and get quick replies. We advise also that you state in your advertisement the present location of plant that is offered for sale, or point of delivery provided you are in the market for equipment.

TO SIGN YOUR NAME and address to your advertisement begets the confidence of the reader and facilitate receiving replies. You can however, obviate delay in receiving answers by signing your ad. only with initials (your own or others), care of your home, your office or a post-office box number in your city.

For quick and satisfactory results tell the reader everything that he will want to know

---

POSITIONS WANTED

ENGINEER Maintenance of Way and Construction Engineer, technical, 15 years' experience, street and interurban railways, all types track construction, designs railway structures. Extensive valuations. Age 36; married. References exchanged. PW-165, Elec. Ry. Journal, Chicago.

FOREMAN of shops and equipment city and high-speed interurban. Thoroughly familiar with type M and HL control, straight and automatic air; now employed but considers making change. PW-159, Elec. Ry. Journal, Chicago.

GENERAL auditor or secretary-treasurer Public Utility Company wants position. Twenty years' experience gas, electric, street railway accounting. Minimum salary $3000. PW-154, Elec. Ry. Journal.

MASTER mechanic wants position, man with experience both city and interurban. Can furnish best of reference. PW-160. Elec. Ry. Journal, Cleveland.

MASTER mechanic wants position; experienced on city and interurban cars; familiar with G. E. and Westinghouse multiple control. Can maintain equipment at high standard. PW-169, Elec Ry. Journal, Cleveland.

SUPERINTENDENT, Dispatcher or Inspector of Transportation by a young man with (17) seventeen years of successful experience in all branches, including the making of time tables. PW-164, Elec. Ry. Journal, Philadephia.

FOR SALE

One 80 hp. Horizontal Mietz & Weiss

OIL ENGINE

complete with stack; engine in first-class condition.

LINCOLN MILLS, INC.
Lincoln, Neb.

WANTED

TROLLEY LOCOMOTIVES

5 to 7 tons, 20- and 24-inch gauge, 250 volts. Also 5000 ft. of trolley, etc.

American Zinc Co. of Tennessee
Mascot, Tenn.

Get your Wants into the Searchlight

SEARCHLIGHT SECTION

The Searchlight Advertising in This Paper

is read by men whose success depends upon thorough knowledge of means to an end—whether it be the securing of a good second-hand piece of apparatus at a moderate price, or an expert employee.

The Best Proof

of this is the variety of this journal's Searchlight ads. Without a constant and appreciable *demand* for such machinery or services, by its readers, the market-place which these advertisements represent could not exist for any length of time.

Are *you* using the Searchlight Section?

In Replying to "Blind" Ads

be careful to put on envelope the key number in the ad. and also local address of office to which reply is sent.

10th Ave. at 36th St., New York.
1570 Old Colony Bldg., Chicago.
657 Leader-News Bldg., Cleveland.
935 Real Estate Trust Bldg., Phila.
501 Rialto Bldg., San Francisco.

Important

Original letters of recommendation or other papers of value should not be enclosed to unknown correspondents—send copies.

POSITIONS VACANT

ASSISTANT to Vice President and General Manager of large urban and interurban railway system. Must be keen, strong man; experienced in operation, in efficiency and economy studies, in drafting of papers and in negotiation. Give career in school and business, and state age and salary expected. Address P-168, Elec. Ry. Journal, Philadelphia.

MASTER mechanic for a hundred car road in Eastern part of the United States. Must be strictly sober and capable of handling men efficiently. Must have ability to maintain equipment at a high standard. State experience and qualifications, also salary expected. P-170, Elec. Ry. Journal.

MANUFACTURER wants draftsman or engineer familiar with car design, able to work into sales department. State experience and salary. P-166, Elec. Ry. Journal, Chicago.

THREE good pitmen wanted, 45c. per hour, eight hours, time and half overtime, good working conditions. Will refund one-half of railroad fare after six months' service. Reference first letter. P. 155, Elec. Ry. Journal, San Francisco.

WORKING carbarn foreman for a small street railway system in Colorado wanted. Man must be familiar with armature winding and competent to do and direct all carbarn work. Address P-163, Elec. Ry. Journal, Chicago.

WORKING master mechanic for medium sized road. State experience, salary expected and when ready to report. P-167, Elec. Ry. Journal, Philadelphia.

WANTED—DRAFTSMEN

UNITED STATES CIVIL SERVICE

ENGINEERING DRAFTSMEN

Bureau of Yards and Docks, Navy Dept.

The United States Civil Service Commission announces an open competitive examination for engineering draftsmen, for both men and women. Vacancies in the Bureau of Yards and Docks, Navy Department, for duty in the Department at Washington, D.C., or at any navy yard or other naval establishment of the United States, at $3.04 to $7.04 per diem, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

This examination is given for draftsmen of the following classes:

A. Heating and ventilating draftsman.
B. Power-plant draftsman.
C. Electrical draftsman.
D. General engineering draftsman.

These examinations are open to all citizens of the United States who meet the requirements.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C. On account of the urgent needs of the service, applications will be received until further notice. Papers will be rated promptly and certification made as the needs of the service require.

These Pages

receive the attention of electrical railway men everywhere. In every industry—in every form of electric service. Have you any proposition to put before these men? Anything to sell or buy that they may want or have? Whatever your message—

Employment or Business Opportunities Offered or Wanted :: Plants, Properties, or Used Equipment For Sale or Wanted :: Bids Wanted for Furnishing Equipment or Supplies ::

these pages—the "SEARCHLIGHT SECTION" of Electric Railway Journal will place your wants before over 8000 men. TRY THEM!

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Holden & White, Inc.

Alloys, Steel and Iron. (See also Bearings and Bearing Metals.)
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Ohio Brass Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improv. Co.

Automobiles and Buses.
Brill Co., The J. G.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
National Railway Appliance Co.
St. Louis Car Co.
Standard Steel Works Co.
Taylor Electric Truck Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
American Railway Supply Co.
Electric Service Supplies Co.
International Register Co., The.
Woodman Mfg. & Supply Co., R.

Bankers and Brokers.
Coal & Iron National Bank.

Batteries, Dry.
Johns-Manville Co., H. W.
Nichols-Lintern Co.

Batteries, Storage.
Electric Storage Battery Co.

Bearings and Bearing Metals.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
More-Jones Brass & M. Co.
St. Louis Car Co.
Taylor Elec. Truck Co.
Westinghouse Elec. & M. Co.

Bearings, Center and Roller Side.
Holden & White, Inc.

Bearings, Oil-less, Graphite, Bronze and Wood.
Bound Brook Oil-less Bearing Co.

Bearings, Roller and Ball.
Gurney Ball Bearing Co.
Railway Roller Bearing Co.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail.
Niles-Bement-Pond Co.
Watson-Stillman Co.
Zelnicker Supply Co., W. A.

Blasting Powder and Equipment.
Du Pont de Nemours Co., E. I.

Boiler Cleaning Compounds.
Johns-Manville Co., H. W.

Boiler Coverings.
Johns-Manville Co., H. W.

Boiler Graphite.
Dixon Crucible Co., Joseph.

Boiler Tubes.
National Tube Co.

Boilers.
Babcock & Wilcox Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
Electric Railway Improv. Co.
Imperial Brass Mfg. Co.
Lincoln Bonding Co.
Ohio Brass Co.

Bonding Tools.
American Steel & Wire Co.
Electric Railway Improv. Co.
Electric Service Supplies Co.
Ohio Brass Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improv. Co.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Lincoln Bonding Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Piling and Lumber.)
American Bridge Co.
Creaghead Engrg. Co.
Electric Railway Equipment Co.
Electric Service Supplies Co.
Hubbard & Co.
Lindsley Bros. Co.
Ohio Brass Co.

Brake Adjusters.
Holden & White, Inc.
Westinghouse Trac. Brake Co.

Brake Shoes.
American Brake S. & Fdy. Co.
Barbour-Stockwell Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
St. Louis Car Co.
Taylor Elec. Truck Co.
Wheel Truing Brakeshoe Co.

Brakes, Brake Systems and Brake Parts.
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
National Brake Co.
St. Louis Car Co.
Safety Car Devices Co.
Taylor Elec. Truck Co.
Westinghouse Trac. Brake Co.

Bridges and Buildings
American Bridge Co.

Brooms, Track, Steel or Rattan.
Zelnicker Supply Co., W. A.

Brushes, Carbon.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
United States Graphite Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
United States Graphite Co.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Eureka Co.

Bunkers, Coal.
American Bridge Co.

Bus Bar Supports
Philadelphia Electric Co.

Bushings, Case Hardened Manganese.
Bemis Car Truck Co.

Bushings, Graphite and Wooden.
Bound Brook Oil-less Bearing Co.

Cables. (See Wires and Cables.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc., see those Headings.)

Car Trimmings. (For Curtains, Doors, Seats, etc., see those Headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Kuhlman Car Co., G. C.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.
Wason Mfg. Co.

Cars, Second Hand.
Electric Equipment Co.

Cars, Self-Propelled.
Electric Storage Battery Co.
General Electric Co.

Castings, Brass, Composition or Copper.
Anderson M. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
Horne Mfg. Co.
More-Jones Brass & M. Co.

Castings, Gray Iron and Steel.
American B. S. & Fdry. Co.
American Bridge Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
St. Louis Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
American Brake S. & Fdry. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Electric Service Supplies Co.
Holden & White, Inc.
Horne Mfg. Co.
Ohio Brass Co.
Trolley Supply Co.
Wood Co., C. N.

Ceiling, Car.
Pantasote Co.

Checks, Employees.
American Railway Supply Co.

Circuit Breakers.
General Electric Co.
Westinghouse Elec. & M. Co.

Clamps and Connectors, for Wires and Cables.
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Cleaners & Scrapers, Track. (See also Snow-Plows, Sweepers and Brooms.)
Brill Co., The J. G.
Ohio Brass Co.

Clusters & Sockets.
General Electric Co.

Coal and Ash Handling. (See Conveying and Hoisting Machinery.)

Coasting Recorders.
Railway Improv. Co.

Coil Banding and Winding Machines.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Coils, Armature and Field.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
King-Coil Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Coils, Choke & Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
Electric Service Supplies Co.
International Register Co.

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.
Wood Co., C. N.

Commutator Slotting Files.
Handy Supply Co.

Commutator Stones.
Handy Supply Co.

Commutator Truing Devices.
General Electric Co.

Commutators or Parts.
Cameron Elec'l Mfg. Co.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
King-Coil Mfg. Co.
Mica Insulator Co.
Westinghouse Elec. & M. Co.

Compressors, Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Traction Brake Co.

Concrete Mixers
Jaeger Machine Co.

Condensers.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Conduits, Underground.
Johns-Manville Co., H. W.
Standard Underground Cable Co.

Connectors, Solderless
Westinghouse Elec. & Mfg. Co.

Controller Regulators.
Electric Service Supplies Co.

Controllers or Parts.
Allis-Chalmers Mfg. Co.
Columbia M. W. & M. I. Co.
General Electric Co.
Horne Mfg. Co.
Johns-Manville Co., H. W.
Westinghouse Elec. & M. Co.

Controlling Systems.
General Electric Co.
Westinghouse Elec. & M. Co.

Converters, Rotary.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Conveying and Hoisting Machinery.
American Bridge Co.
Columbia M. W. & M. I. Co.
Green Eng'g Co.

Cord, Bell, Trolley, Register, Etc.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The.
Roebling's Sons Co., John A.
Samson Cordage Works.
Trolley Supply Co.

Cord Connectors and Couplers.
Electric Service Supplies Co.
Samson Cordage Works.
Wood Co., C. N.

Couplers, Car.
Brill Co., The J. G.
Ohio Brass Co.
Van Dorn Coupler Co.
Westinghouse Trac. Brake Co.

Couplings, Conduit.
Horne Mfg. Co.

Cranes. (See also Hoists.)
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.

Creosoting. (See Wood Preservatives.)

Cross Arms. (See Brackets.)

Crossing Foundations.
Balkwill Manganese Crossing Co.
International Steel Tie Co.

Crossing Signals. (See Signals, Crossing.)

Crossings, Track. (See Track, Special Work.)

Crushers, Rock.
Allis-Chalmers Mfg. Co.

Culverts.
Canton Culvert & Silo Co.

Curtains and Curtain Fixtures.
Brill Co., The J. G.
Du Pont Fabrikoid Co.
Electric Service Supplies Co.
Hartshorn Company, Stewart.
Pantasote Co., The.
St. Louis Car Co.

Cutting Apparatus, Oxy-Acetylene.
Imperial Brass Mfg. Co.



Model 310
Single Phase
and D. C. Wattmeter

One of the Portable Electrodynamometer Group, which also includes Model 329 Polyphase Wattmeter, Model 341 A.C. and D.C. Voltmeter and Model 370 A.C. and D.C. Ammeter.
The characteristics of the group are extreme accuracy (guaranteed within a fraction of 1% full scale value), adaptability for use on circuits of any commercial frequency and any wave form, great overload capacity, low moment of inertia, effective damping and shielding, and the legibility and remarkable uniformity of the hand calibrated scales.

Pacemakers for 29 Years

It is one thing to take the lead; quite another thing to hold it.

Weston

Indicating Instruments

were the first exponents of the Art of Electrical Measurement as it is known today. But of far greater importance is the fact that since the beginning substantially every advance in the Art has originated with this Company and found its first embodiment in this Company's Instruments.

Weston Indicating Instruments include a great variety of groups for portable or switchboard service on A.C. or D.C. Circuits. Instruments designed expressly for testing and laboratory use, for motor car and boat electrical systems, and many others for special purposes. Write for Bulletins or Catalogs describing those which interest you.

Weston Electrical Instrument Company

21 Weston Ave., Newark, N. J.

New York	Chicago	Denver	Montreal
Philadelphia	Boston	Detroit	Vancouver
Pittsburgh	Buffalo	St. Louis	London
Cleveland	Richmond	Toronto	Paris
Cincinnati	San Francisco	Winnipeg	
	Florence	Johannesburg, S. Africa.	

B. A. Hegeman, Jr., President; Charles C. Castle, First Vice-President; E. D. Hillman, Secretary and Engineer. Harold A. Hegeman, President and Treasurer. Fred C. Dunham, Assistant to President.

NATIONAL RAILWAY APPLIANCE COMPANY

50 East 42d St., NEW YORK CITY

Hegeman-Castle Corporation, Chicago
National Railway Appliance Co., Washington, D. C.

RAILWAY SUPPLIES

Selling Agents for Tool Steel Gears and Pinions, Johnson Fare Boxes, Perry Side Bearings, Hartman Centering Center Plates, Wasson Trolley Bases, Rimco Rubber Insulated Pliers, Garland Ventilators, Electric Arc Welders, High Class Railway Varnishes and Enamels, Axles and Forgings.

Special Agents for Tool Steel Gear & Pinion Co., Rubber Insulated Metals Corp., Johnson Fare Box Co., C. & C. Electric & Mfg. Co., Holden & White, Inc. General Agents for Anglo-American Varnish Co. Eastern Agents for Union Fibre Co. Eastern & Southern Agents for Laclede Steel Co.

MORE-JONES V-K

Using the V-K Oilless Trolley Wheel and V-K Non-Arcing Harp saves power and insures maximum conductivity with entire freedom from interruptions of current to the pole. It leads to improved service and longer wheel mileage.

Catalog on request.

More-Jones Brass & Metal Co.

St. Louis, Mo.

Oilless Trolley Wheel



Get those coils back into service—quick!

Don't let LABOR SHORTAGE hold them up in your coil department. You can't get more men—but you can save time and money by sending the coils to us for re-insulation with

SALAMANDER Pure Asbestos

We will return them promptly—better insulated and more durable than when new.
"Salamander" asbestos wire excels in insulating value and cannot burn out under the severest overload.
Leading electric railways are our best customers.
Write us for details now.

Independent Lamp & Wire Co., Inc.

OFFICES: 1737 Broadway, New York
FACTORIES: York, Pa., and Weehawken, N. J.

WHAT AND WHERE TO BUY

Derailing Devices.
Cleveland Frog & Crossing Co.

Destination Signs.
Columbia M. W. & M. I. Co.
Creaghead Engrg. Co.
Electric Service Supplies Co.

Detective Service.
Wisch Service, P. Edward.

Door Operating Devices.
Consolidated Car Heating Co.
National Pneumatic Co., Inc.
Safety Car Devices Co.

Doors, Asbestos.
Johns-Manville Co., H. W.

Doors and Door Fixtures.
Brill Co., The J. G.
Hale & Kilburn Corp.

Doors, Folding Vestibule.
National Pneumatic Co., Inc.

Draft Rigging. (See Couplers, Car.)

Drills, Track.
American Steel & Wire Co.
Electric Service Supplies Co.
Long Co., E. G.
Niles-Bement-Pond Co.
Ohio Brass Co.

Dryers, Sand.
Electric Service Supplies Co.
Zelnicker Supply Co., W. A.

Electrical Wires and Cables
Roebling's Sons Co., J. A.

Engineers, Consulting, Contracting and Operating.
Archbold-Brady Co.
Arnold Co., The.
Beeler, John A.
Byllesby & Co., H. M.
Drum & Co., A. L.
Ford, Bacon & Davis.
Pugh, S. D.
Richey, Albert S.
Sanderson & Porter.
Sargent & Lundy.
Scofield Engineering Co.
Sloan, Huddle, Feustel & Freeman
Stone & Webster.
White Companies, The J. G.
Woodmansee & Davidson Engineering Co.

Engines, Gas and Oil.
Allis-Chalmers Mfg. Co.
Westinghouse Elec. & M. Co.

Excavators
General Eng. & Constr. Co.

Engines, Steam.
Allis-Chalmers Mfg. Co.
Westinghouse Elec. & M. Co.

Fare Boxes.
Brill Co., The J. G.
Cleveland Fare Box Co.
International Register Co, The
National Railway Appliance Co.
Ohmer Fare Register Co.

Fences, Woven Wire and Fence Posts
American Steel & Wire Co.
Page Steel & Wire Co.
Standard Steel Mould Co.

Fenders and Wheel Guards.
Brill Co., The J. G.
Cleveland Fare Box Co.
Consolidated Car Fender Co.
Electric Service Supplies Co.
Star Brass Works.
Trolley Supply Co.
Wood Co., Chas. N.

Fibre and Fibre Tubing.
Johns-Manville Co., H. W.
Westinghouse Elec. & M. Co.

Field Coils. (See Coils.)

Filters, Water.
Scaife & Sons Co., Wm. B.

Fire Extinguishing Apparatus.
Johns-Manville Co., H. W.

Fire-Proofing Materials.
Johns-Manville Co., H. W.

Floodlights.
Crouse-Hinds Co.
Electric Service Supplies Co.

Flooring, Composition.
American Mason Safety T. Co.
Johns-Manville Co., H. W.

Forgings.
Columbia M. W. & M. I. Co.
Eureka Co.
Standard Steel Works Co.

Fuses and Fuse Boxes.
Chicago Fuse Mfg. Co.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Johns-Manville Co., H. W.
Westinghouse Elec. & M. Co.

Fuses, Refillable.
Columbia M. W. & M. I. Co.
Economy Fuse & Mfg. Co.
General Electric Co.
Horne Mfg. Co.

Gages, Oil and Water.
Ohio Brass Co.

Gaskets.
Johns-Manville Co., H. W.
Power Specialty Co.
Westinghouse Trac. Brake Co.

Gas-Electric Cars.
General Electric Co.

Gas Producers.
Westinghouse Elec. & M. Co.

Gates, Car.
Brill Co., The J. G.

Gear Blanks.
Carnegie Steel Co.
Standard Steel Wks. Co.

Gear Cases.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Westinghouse Elec. & M. Co.

Gears and Pinions.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
National Ry. Appliance Co.
Nuttall Co., R. D.

Generating Sets, Gas-Electric.
General Electric Co.

Generators.
Allis-Chalmers Mfg. Co.
Dick, Kerr & Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Gongs. (See Bells and Gongs.)

Graphite.
Morgan Crucible Co.

Grates, Chain.
Green Eng'g Co.

Greases. (See Lubricants.)

Grinding Blocks & Wheels
Railway Track-work Co.

Grinders and Grinding Supplies.
Indianapolis Swith & Frog Co.
Railway Track-work Co.

Guards, Cattle.
American Bridge Co.

Guards, Trolley.
Electric Service Supplies Co.
Ohio Brass Co.

Harps, Trolley.
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
More-Jones Brass & M. Co.
Nuttall Co., R. D.
Star Brass Works.
Western Electric Co.

Headlights.
Crouse-Hinds Co.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
St. Louis Car Co.
Trolley Supply Co.

Headlining.
Panjasote Co., The.

Heaters, Car, Electric.
Consolidated Car Heating Co.
Gold Car Heating & Lighting Co.
Smith Heater Co., Peter.

Heaters, Car, Hot Air and Water.
Cooper Heater Co.
Smith Heater Co., Peter.

Heaters, Car, Stove.
Electric Service Supplies Co.
Smith Heater Co., Peter.

Hoists and Lifts.
Columbia M. W. & M. I. Co.
Duff Manufacturing Co.
Ford Chain Block & Mfg. Co.
Niles-Bement-Pond Co.
Yale & Towne Mfg. Co.

Hose Bridges.
Ohio Brass Co.

Hose, Pneumatic and Fire.
Johns-Manville Co., H. W.

Hydraulic Machinery.
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.
Watson-Stillman Co.

Hydrogrounds.
Horne Mfg. Co.

Inspection.
Elec'l Testing Laboratories.

Instruments, Measuring, Testing and Recording.
Economy Electric Devices Co.
General Electric Co.
Johns-Manville Co., H. W.
Westinghouse Elec. & M. Co.
Weston Elec'l Instrument Co.

Insulated Wire Cutters
Rubber Ins. Metals Corp.

Insulating Cloths, Paper and Tape.
Anchor Webbing Co.
General Electric Co.
Hope Webbing Co.
Horne Mfg. Co.
Irvington Varnish & Ins. Co.
Johns-Manville Co., H. W.
Mica Insulator Co.
Mitchell-Rand Mfg. Co.
Okonite Co.
Standard Paint Co.
Standard Underground Cable Co.
Standard Woven Fabric Co.
United States Rubber Co.
Westinghouse Elec. & M. Co.

Insulation. (See also Paints.)
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Horne Mfg. Co.
Johns-Manville Co., H. W.
Mitchell-Rand Mfg. Co.
Okonite Co.
United States Rubber Co.
Westinghouse Elec. & M. Co.

Insulators. (See also Line Material.)
Anderson M. Co., A. & J. M.
Creaghead Engrg. Co.
Drew Elec. & Mfg. Co.
Electric Railway Equipment Co.
Electric Service Supplies Co.
General Electric Co.
Horne Mfg. Co.
Johns-Manville Co., H. W.
Macallen Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Insulator Pins.
Electric Service Supplies Co.
Hubbard & Co.

Inventions, Developed and Perfected.
Peters & Co., G. D.

Jacks. (See also Cranes, Hoists and Lifts.)
Brill Co., The J. G.
Buckeye Jack Mfg. Co.
Columbia M. W. & M. I. Co.
Duff Manufacturing Co.
National Ry. Appliance Co.
Templeton Kenly & Co., Ltd.
Watson-Stillman Co.

Joints, Rail.
Carnegie Steel Co.
Lackawanna Steel Co.
Zelnicker Supply Co., W. A.

Journal Boxes.
Bemis Car Truck Co.
Brill Co., The J. G.
Gurney Ball Bearing Co.
Railway Roller Bearing Co.

Junction Boxes.
Johns-Manville Co., H. W.
Standard Underground Cable Co.

Laboratories.
Elec'l Testing Laboratories.

Lamp Guards and Fixtures.
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Lamps, Arc and Incandescent.
Anderson M. Co., A. & J. M.
General Electric Co.
Westinghouse Elec. & M. Co.

Lamps, Signal and Marker.
Nichols-Lintern Co.
Ohio Brass Co.

Lathes, Car Wheel.
Niles-Bement-Pond Co.

Lighting Regulators, Car.
Holden & White, Inc.

Lightning Arresters.
Horne Mfg. C.

Lightning Protection.
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Line Material. (See also Brackets, Insulators, Wires, etc.)
Anderson M. Co., A. & J. M.
Archbold-Brady Co.
Columbia M. W. & M. I. Co.
Creaghead Engrg. Co.
Dick, Kerr & Co.
Drew Elec. & Mfg. Co.
Electric Railway Equipment Co.
Electric Service Supplies Co.
Eureka Co.
General Electric Co.
Holden & White, Inc.
Hubbard & Co.
Johns-Manville Co., H. W.
Macallen Co.
More-Jones Brass & M. Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Locks.
Yale & Towne Mfg. Co.

Locomotives, Electric.
Brill Co., The J. G.
General Electric Co.
Westinghouse Elec. & M. Co.

Lubricating Engineers.
Galena-Signal Oil Co.

Lubricants, Oil and Grease.
Borne, Scrymser Co.
Galena-Signal Oil Co.

Lumber. (See Poles, Ties, Posts, etc.)

Machine Work.
Columbia M. W. & M. I. Co.
Holden & White, Inc.
Horne Mfg. Co.

Machine Tools.
Columbia M. W. & M. I. Co.
Niles-Bement-Pond Co.
Watson-Stillman Co.

Manganese Parts.
Bemis Car Truck Co.

Mats.
Johns-Manville Co., H. W.

Meters, Car, Watthour.
Economy Electric Devices Co.

Meters (See Instruments.)

Mica.
Macallen Co.
Mechanical Rubber Co.

Mirrors for Motormen.
Drew Elec. & Mfg. Co.

Motormen's Seats.
Electric Service Supplies Co.
Wood Co., C. N.

Motor Generator, Bonding and Welding.
Lincoln Bonding Co.

Motors and Generators Sets
General Electric Co.

Motors, Electric.
Allis-Chalmers Mfg. Co.
Dick, Kerr & Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Nuts and Bolts.
Allis-Chalmers Mfg. Co.
Barbour-Stockwell Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Hubbard & Co.
Lackawanna Steel Co.

Oils. (See Lubricants.)

Overhead Equipment. (See Line Material.)

Oxy-Acetylene. (See Cutting Apparatus, Oxy-Acetylene.)

Packing.
Johns-Manville Co., H. W.
Power Specialty Co.
United States Rubber Co.
Westinghouse Trac. Brake Co.

Packing Rings.
Johns-Manville Co., H. W.

Paints and Varnishes. (Insulating.)
Holden & White, Inc.
Irvington Varnish & Ins. Co.
Johns-Manville Co., H. W.
Mica Insulator Co.
Mitchell-Rand Mfg. Co.
Standard Paint Co.

Paints and Varnishes. (Preservative.)
Johns-Manville Co., H. W.
Standard Paint Co.

Paints and Varnishes for Woodwork.
National Railway Appliance Co.

Paving Bricks, Filler and Stretcher.
Nelsonville Brick Co.

Paving Material.
American B. S. & Fdry. Co.
Nelsonville Brick Co.



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Ohio Brass Co.

Pinion Pullers.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
Wood Co., C. N.

Pinions. (See Gears.)

Pins, Case Hardened, Wood and Iron.
Bemis Car Truck Co.
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse Trac. Brake Co.

Pipe.
National Tube Co.

Pipe Fittings.
Power Specialty Co.
Standard Steel Works Co.
Watson-Stillman Co.
Westinghouse Trac. Brake Co.

Pliers, Insulated.
Electric Service Supplies Co.
National Railway Appliance Co.
Rubber Ins. Metals Corp.

Pneumatic Hose.
Westinghouse Trac. Brake Co.

Poles, Metal Street.
Electric Railway Equipment Co.
Hubbard & Co.
National Railway Appliance Co.

Pole Sleeves.
Drew Elec. & Mfg. Co.

Poles, Ties, Posts, Piling and Lumber.
Carney & Co., B. J.
Lindsley Bros. Co.
Southern Cypress Mfgrs. Assn.
Western Red Cedar Assn.
White Marble Lime Co.

Poles and Ties, Treated.
Lindsley Bros.

Poles, Trolley.
Anderson M. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
National Tube Co.
Nuttall Co., R. D.

Pole Reinforcing.
Hubbard & Co.

Poles, Tubular Steel.
National Tube Co.

Potheads.
Okonite Co.

Power Saving Devices.
Arthur Power-Saving Recorder Co.

Pressure Regulators.
General Electric Co.
Ohio Brass Co.
Westinghouse Trac. Brake Co.

Pumps.
Allis-Chalmers Mfg. Co.
Watson-Stillman Co.

Punches, Ticket.
American Railway Supply Co.
Bonney-Vehslage Tool Co.
Horne Mfg. Co.
International Register Co., The
Wood Co., C. N.
Woodman Mfg. & Supply Co., R.

Punching Machinery.
Watson-Stillman Co.

Purifiers, Feed Water.
Scaife & Sons Co., Wm. B.

Rail Grinders. (See Grinders.)

Rails, Relaying.
Zelnicker Supply Co., W. A.

Rail Welding. (See Welding Processes and Apparatus.)

Rattan.
Brill Co., The J. G.
Electric Service Supplies Co.
Hale & Kilburn Corp.
St. Louis Car Co.

Recorders, Power Saving.
Arthur Power-Saving Recorder Co.

Registers and Fittings.
Bonham Recorder Co.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The
Ohmer Fare Register Co.
Rooke Automatic Register Co.

Reinforcing Concrete.
American Steel & Wire Co.

Repair Shop Appliances. (See also Coil Banding and Winding Machines.)
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Repair Work. (See also Coils, Armature and Field.)
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
General Electric Co.
Independent Lamp & W. Co.
King-Coil Mfg. Co.
Westinghouse Elec. & M. Co.

Replacers, Car.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Resistance, Grid.
Columbia M. W. & M. I. Co.
Ellcon Co.

Resistance, Wire and Tube.
General Electric Co.
Westinghouse Elec. & M. Co.

Retrievers, Trolley. (See Catchers and Retrievers, Trolley.)

Rheostats.
Ellcon Co.
General Electric Co.
Westinghouse Elec. & M. Co.
Mica Insulator Co.

Roofing, Building.
Johns-Manville Co., H. W.
Standard Paint Co.

Roofing, Car.
Johns-Manville Co., H. W.
Pantasote Co., The.

Rubber Specialties of all Kinds.
United States Rubber Co.

Sanders, Track.
Brill Co., The J. G.
Cleveland Fare Box Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Holden & White, Inc.
Horne Mfg. Co.
Nichols-Lintern Co.
Ohio Brass Co.
St. Louis Car Co.

Sash Fixtures, Car.
Brill Co., The J. G.

Sash, Metal, Car Windows.
Hale & Kilburn Co.

Scales, Weights, Balances and Dynamometers.
Horne Mfg. Co.

Seating Material. (See also Rattan.)
Brill Co., The J. G.
Du Pont Fabrikoid Co.
Pantasote Co., The.

Seats, Car.
Brill Co., The J. G.
Hale & Kilburn Corp.
Peters & Co., G. D.
St. Louis Car Co.

Second-Hand Equipment. (See Searchlight Section.)
Archer & Baldwin.
MacGovern & Co.

Shade Rollers.
Hartshorn Co., Stewart.

Shades, Vestibule.
Brill Co., The J. G.

Shovels.
Hubbard & Co.

Shovels, Power.
Allis-Chalmers Mfg. Co.

Signals, Car.
Nichols- Lintern Co.

Signals, Car Starting.
Electric Service Supplies Co.
Consolidated Car Heating Co.
National Pneumatic Co.

Signals, Highway Crossing.
Nachod Signal Co. Inc.
U. S. Electric Signal Co.

Signal Systems, Block.
Electric Service Supplies Co.
Federal Signal Co.
Nachod Signal Co. Inc.
Union Switch & Signal Co.
U. S. Electric Signal Co.
Wood Co., C. N.

Slack Adjusters. (See Brake Adjusters.)

Sleet Wheels and Cutters.
Anderson M. Co., A. & J. M.
Bonney-Vehslage Tool Co.
Columbia M. W. & M. I. Co.
Drew Elec. & Mfg. Co.
Holden & White, Inc.
More-Jones Brass & M. Co.
Nuttall Co., R. D.

Snow-Plows, Removers, Sweepers, etc.
Brill Co., The J. G.
Consolidated Car Fender Co.
Columbia M. W. & M. I. Co.

Soldering and Brazing Apparatus. (See Welding Proc. & App.)

Solderless Connectors
Westinghouse Elec. & Mfg. Co.

Speed Indicators.
Johns-Manville Co., H. W.
Wood Co., C. N.
Woodman Mfg. & Supply Co., R.

Spikes.
American Steel & Wire Co.
Lackawanna Steel Co.

Splicing Compounds.
Johns-Manville Co., H. W.
Standard Woven Fabric Co.
United States Rubber Co.
Westinghouse Elec. & M. Co.

Splicing Sleeves. (See Clamps and Connectors.)

Springs, Car & Truck.
American Steel & Wire Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Standard Steel Works Co.
Taylor Elec. Truck Co.
Union Spring & Mfg. Co.

Sprinklers, Track and Road.
Brill Co., The J. G.
St. Louis Car Co.

Steps, Car.
American Mason S. T. Co.
Universal Safety Tread Co.

Stokers, Mechanical.
Babcock & Wilcox Co.
Green Engrg. Co.
Westinghouse Elec. & M. Co.

Storage Batteries. (See Batteries, Storage.)

Strand
Roebling's Sons Co., J. A.

Straps, Car, Sanitary.
Holden & White, Inc.
Railway Improvement Co.

Structural Iron. (See also Bridges.)

Superheaters.
Babcock & Wilcox.
Power Specialty Co.

Sweepers, Snow. (See Snow-Plows, Sweepers and Brooms.)

Switchstands.
Indianapolis Switch & Frog Co.
Kilby Frog & Switch Co.
Ramapo Iron Works.

Switches, Track. (See Track, Special Work.)

Switches and Switchboards.
Allis-Chalmers Mfg. Co.
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Tampers, Tie.
Ingersoll-Rand Co.

Tapes & Cloth. (See Insulating Cloths, Paper and Tape.)

Telephones and Parts.
Electric Service Supplies Co.

Terminals.
Frankel Connector Co.

Terminal Cables.
Standard Underground Cable Co.

Testing, Commercial and Electrical.
Electrical Testing Laboratories.

Testing Instruments. (See Instruments, Electrical, Measuring, Testing.)

Thermostats.
Consolidated Car Heating Co.
Gold Car Heating & Lighting Co.
Railway Utility Co.
Smith Heater Co., Peter.

Ticket Boxes.
Macdonald Ticket & Ticket Box Co.

Ticket Choppers and Destroyers.
Electric Service Supplies Co.

Tickets and Transfers.
American Railway Supply Co.

Ties, Mechanical.
Dayton Mechanical Tie Co.

Ties and Tie Rods, Steel.
American Bridge Co.
Barbour-Stockwell Co.
Carnegie Steel Co.
International Steel Tie Co.

Ties, Wood. (See Poles, Ties, etc.)

Tools, Track and Miscellaneous.
American Steel & Wire Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Johns-Manville Co., H. W.
Railway Track-work Co.

Torches, Acetylene. (See Cutting Apparatus, Oxy-Acetylene.)

Towers and Transmission Structures.
American Bridge Co.
Archbold-Brady Co.
Westinghouse Elec. & M. Co.

Track, Special Work.
Barbour-Stockwell Co.
Cleveland Frog & Crossing Co.
Columbia M. W. & M. I. Co.
Indianapolis Switch & Frog Co.
Kilby Frog & Switch Co.
New York Switch & Crossing Co.
Ramapo Iron Works.

Transfers. (See Tickets.)

Transfer Issuing Machines.
Ohmer Fare Register Co.

Transfer Tables.
American Bridge Co.
Archbold-Brady Co.

Transformers.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Treads, Safety Stair Car Step.
American Mason Safety Tread Co.
Universal Safety Tread Co.

Trolley Bases.
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
More-Jones Brass & M. Co.
National Railway Appliance Co.
Nuttall Co., R. D.
Ohio Brass Co.
Trolley Supply Co.

Trolley Bases, Retrieving.
Holden & White, Inc.

Trolley Shoes.
Holden & White, Inc.

Trolley Wire
Roebling's Sons Co., J. A.

Trolleys and Trolley Systems.
Ford Chain Block & Mfg. Co.

Trucks, Car.
Bemis Car Truck Co.
Brill Co., The J. G.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.
Taylor Elec. Truck Co.

Tubing, Steel.
National Tube Co.

Turbines, Steam.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Turbines, Water.
Allis-Chalmers Mfg. Co.

Turnstiles.
Perey Mfg. Co., Inc.

Vacuum Impregnation.
Allis-Chalmers Mfg. Co.

Valves.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Varnishes. (See Paints, etc.)

Ventilators, Car.
Brill Co., The J. G.
Holden & White, Inc.
National Railway Appliance Co
Nichols-Lintern Co.
Railway Utility Co.
St. Louis Car Co.

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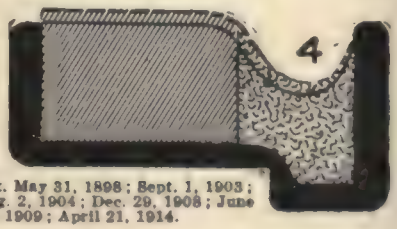
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Electric Railway Improv. Co.
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Electric Railway Improvement Co.
General Electric Co.
Imperial Brass Mfg. Co.
Indianapolis Switch & Frog Co.
National Ry. Appliance Co.
Westinghouse Elec. & M. Co.

WHAT AND WHERE TO BUY

Wheel Grinders.
Wheel Truing Brake Shoe Co.

Wheel Guards. (See Fenders and Wheel Guards.)

Wheels, Car, Cast Iron.
American Steel & Wire Co.
Association of Mfrs. of Chilled Car Wheels.
Bemis Car Truck Co.

Wheels, Car. (Steel and Steel Tired.)
Bemis Car Truck Co.
Carnegie Steel Co.
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Since 1910 the Los Angeles railway has bought 19,000 tons of Titanium-treated rail.

Most of this rail was for 116-lb. heavy service section. Now it specifies Titanium treatment exclusively.

Specify Titanium-Treated Rails

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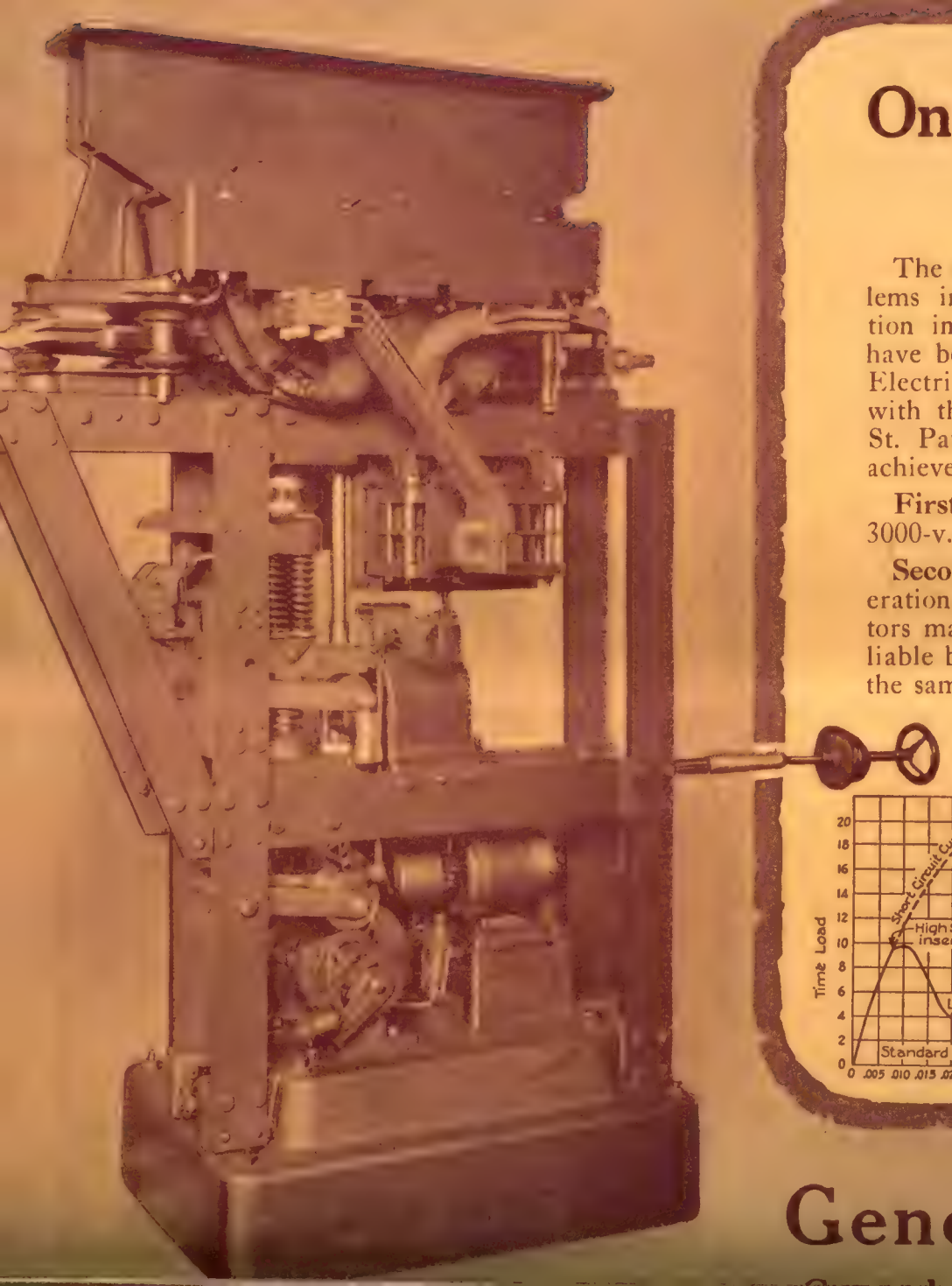
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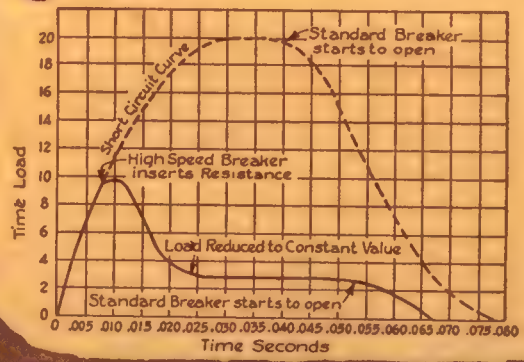
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This protective device can be furnished for generators and synchronous converters and is recommended in all cases where short circuits or unusual load conditions may occur.

Write to the General Electric Company for assistance in solving your protection problems.

25-1

General Electric Company

ELECTRIC RAILWAY JOURNAL

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Higher Merit For Westinghouse
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They will be found in all kinds of service where reliability is imperative—Seventy No. 306-CV motors have been selected and installed on electric cars by the Emergency Fleet Corporation for the transportation of their ship-yard workers, thus providing one of the essentials in the national shipbuilding program.

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East Pittsburgh, Pa.

Sales Offices in All Large American Cities

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Westinghouse

Vol. 51, No. 23 New York, June 8, 1918 Pages 1081 to 1122

Electric Railway Journal

H. W. BLAKE, *Editor*

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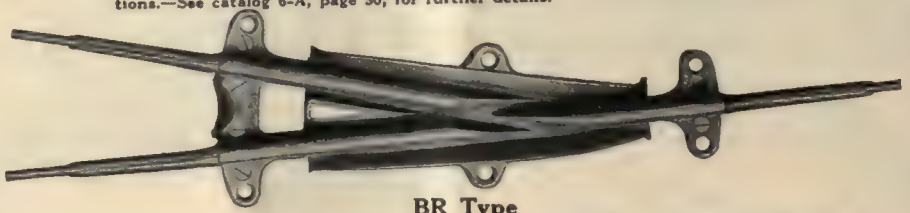
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Trolley Frogs
For Every Condition of Service



Detroit Type

Made in bronze and malleable-iron sherardized bodies, with flexible bronze approaches, in one angle (12°) for any degree of turn out. The curve runner always points to the first pull over on the curve trolley wire, as the proper location of the trolley frog causes the angle to fit all conditions.—See catalog 6-A, page 50, for further details.



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Made in 20° 15°, and 8° angles from high-grade bronze composition, conforming to the A. E. R. A. specifications for bronze castings.—See catalog 6-A, page 52, for further details.



MK Type

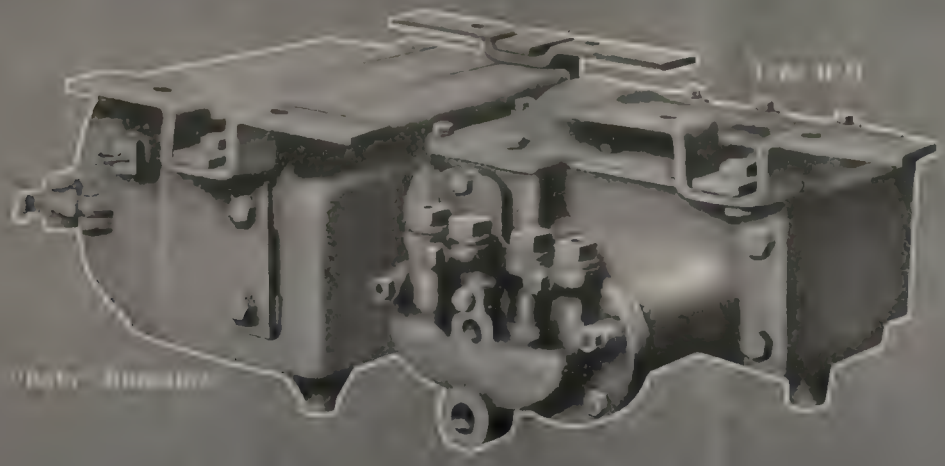
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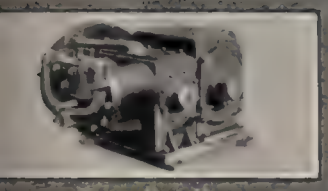
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East Pittsburgh, Pa.

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Westinghouse Air Compressors cover a broad field of service. Meet all operating conditions. Can be fitted to any current. Capacities range from 10 to 150 cubic feet per minute. Write to our nearest office.











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Bridgeport Connecticut

20-2

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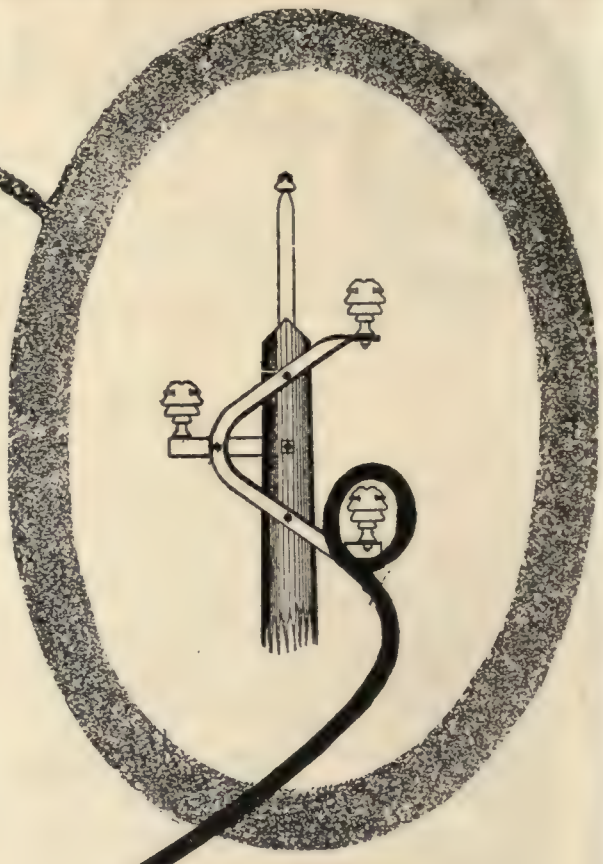
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One 33,000 volt line on Bo-Arrow arms and Peirce Forged Steel Pins. Two 33,000 volt lines on Steel Angle arms and Peirce pins. (Pittsburgh, Pa.)



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A close-up view of the forged steel Peirce Pin for high-tension lines. The threads of the thimble fit loosely over the threads of the pin, and a thin cork disc is provided between the top of the pin and the thimble. Under expansion the pin simply rides up further in the thimble, the cork disc compressing. None of the strain is communicated to the insulator.

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in the Case of

INTERNATIONAL
STEEL TWIN TIES

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Section of track 100 ft. long; 9 ft. wide, with concrete foundation 6 in. under base of tie and concrete between ties.

20	Tie Rods, 2 in. x 5 ft.	at	$0.85	$17.00	
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28.3	Cu.Yds. Concrete	at	5.85	165.56	
34	Cu.Yds. Excavation	at	1.25	42.50	$316.56

International Steel Twin Tie Track

Section of track 100 ft. long, 7 ft. wide with concrete slab 7 in. thick under tie plate, as per The International Steel Tie Company's Drawing No. 135.

16	2/3 Standard Steel Twin Ties	at	$7.00	$116.66	
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15.0	Cu.Yds. Concrete	at	5.85	87.75	
15.2	Cu.Yds. Excavation	at	1.25	19.00	$234.13

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Saving in Cost Below Base of Rail per 100 feet of track . . . $82.43

Saving Per Mile of Track 4352.30

Additional Item Saved:

Tie rods and tie plates unnecessary.

Welded rail joints minimum cost, and cross bonds are not needed.

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A labor saving is made by installing one 132-lb. steel twin tie in place of three 130-lb. wooden ties, the simplicity of the fastening and because track gauging is not necessary as tie punching fixes the rail to perfect gauge.

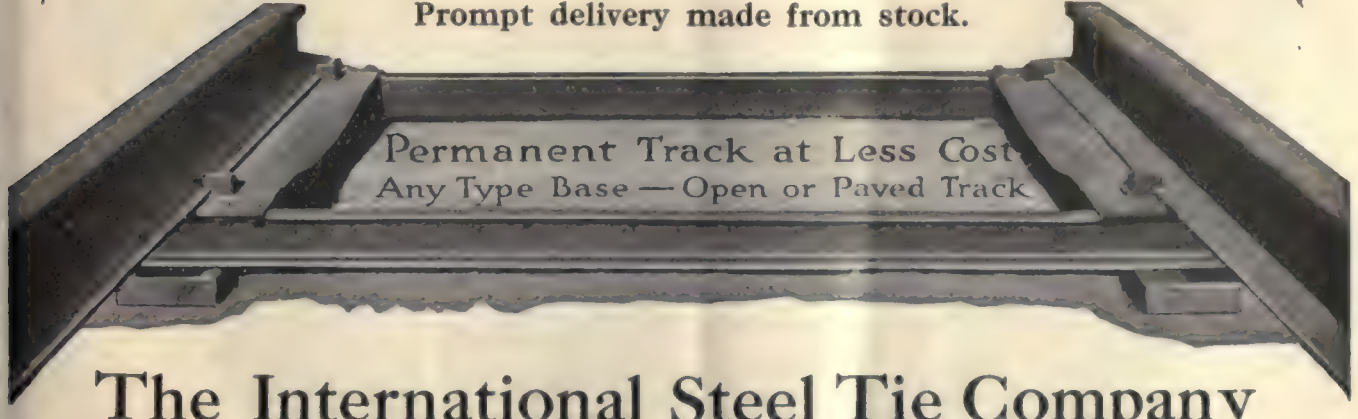
Fifty per cent. labor saving in track construction below base of rail.

Superior form of construction cuts maintenance to a minimum.

All permanent materials produce long life of track.

Concrete foundations with large tie bearing area stays put under the heaviest traffic.

Prompt delivery made from stock.



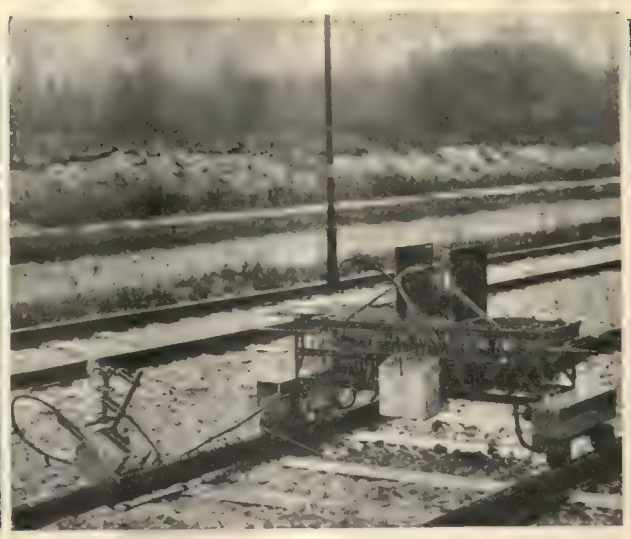
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Manufacturers of Steel Twin Ties and Crossing Foundations

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ERICO
Portable Welder

is the ideal welding apparatus for rail rehabilitation and for arc welding in the shop.

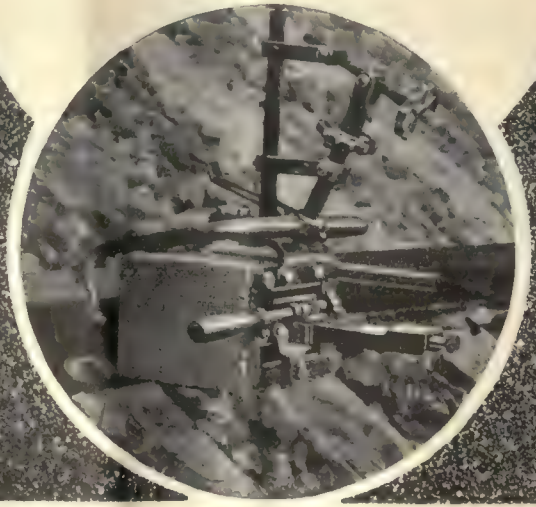
For rail bonding, its light weight makes it possible for two men—a Bonder and a Helper—to do the entire work.

And the bonds made by it are the same *intimate welds* as those produced by our time-tried Erico Bonding Car and the Erico Champion Truck.

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Cleveland, Ohio



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Has a Keen Eye for the Best



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"SAFETY" LIGHTING FIXTURES which assure illumination pleasing to the rider and inexpensive to the railway.

ILLUMINATED DESTINATION SIGNS which can be seen well within braking distance.

"GOLDEN GLOW" HEADLIGHTS which give an effective, yet non-glaring light, equally good for city or country running.

FARADAY CAR SIGNALS which have taken upkeep uncertainties and expense out of push-button signalling by passengers.

AUTOMOTONEERS the best insurance obtainable against reckless running of the car and jerky manipulation of the controller.

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Joint Welding in Street



Gailor Welded Rail Joint

These joints can be installed with but three men at the rate of 2 to 2½ per hour, under 3 minute traffic.

The equipment is also applicable for building up cupped rails, installing Lincoln Bonds and performing shop repairs.

By recent contract arrangements we, and our agents listed below, are now the exclusive sales representatives of all the equipment and rail joints formerly exploited by the Atlantic Welding Company of New York, in addition to our regular products—Dynamotors and Lincoln Bonds.

THE LINCOLN

General Offices: Cleveland **New York Office: 30 Church St.**

ARC-WELDING, JOINTS and BONDS

Dynamotors — Lincoln Bonds — Shop Welding

On private right of way the Lincoln Dynamotors are ideal for applying bonds for the return circuit. By the Lincoln System the bonds are attached permanently, quickly, at lowest cost, and the work may be done without interrupting regular traffic schedules.

They can be welded with but 1-4 K.W. per bond, in 45 seconds.

Bonds can be applied at the rate of over 100 per day.

Lincoln Bonds effect a saving of 25 to 35 cents per bond.



Dynamotor in Use for Shop Welding

It will pay you to investigate the advantages offered by the use of this equipment, because of the unusual economy in materials and labor, and rapidity in accomplishing the work.

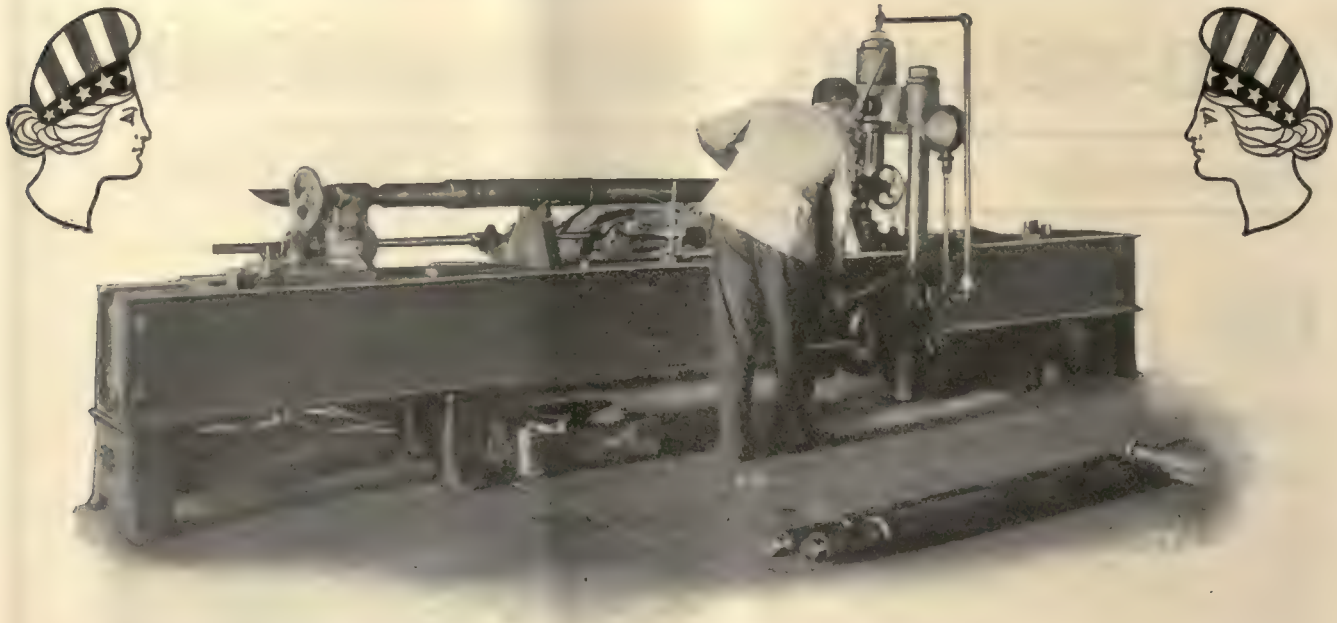
Write us or our nearest agent and let us give you details.



BONDING CO.

AGENTS:

BOSTON, Chas. N. Wood Co. PHILADELPHIA, Railway Trackwork Co. PITTSBURGH, Electrical Engineering & Manufacturing Co. CHICAGO, Holden & White, Inc. ST. LOUIS, W. L. Rose Equip Co CANADA Lyman Tube & Supply Co., Ltd Montreal, Toronto, Winnipeg.



Columbia Axle Straightener in the Shop of the Third Ave. Railway System, New York

The Columbia Axle Straightener Is Giving Good Service Here

IN the shops of the Third Avenue Railway System, New York, just as it is in many other electric railway shops in the United States and elsewhere.

You ought to know all about the Columbia axle-straightener and then you'll order one sure. Here are the main facts:

Will straighten axles and shafts up to 6 in. diameter.

THE center heads remain in the same position during the entire straightening process.

An inside spring in the center heads takes up the pressure at the ends of the shaft, avoiding the removal of the center points from the axle centers when straightening.

Operation is by means of hydraulic pressure.

And the following Columbia Specialties will also satisfy you:

Columbia Machine Works & Malleable Iron Co.

Atlantic Avenue and Chestnut Street, Brooklyn, N. Y.

TOOLS

Armature and Axle Straighteners
Armature shaft straighteners
Armature buggies and stands
Babbitting molds
Banding and heading machines
Car hoists
Car replacers
Coil taping machines for armature leads
Coil winding machines
Pinion pullers
Pit jacks
Signal or target switches
Tension stands

W. R. Kerschner Co., Inc., N. Y.
Holden & White, Inc., Chicago
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Railway & Power Eng. Corp., Ltd., Toronto, Can.



CAR EQUIPMENT

Armature and Axle Bearings
Armature and field coils
Bearings (Axle and Armature)
Brush-holders and Brush-holder springs
Brake, door and other handles
Brake forgings, riggings, etc.
Car trimmings
Commutators
Controller handles
Forgings of all kinds
Gear cases (steel or malleable iron)
Grid resistors
Third-rail shoe beams and accessories
Trolley poles (steel) and wheels



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The First Woman Guard on the New York Municipal Railway's Rapid Transit Cars. 250 of which have National Pneumatic Door Engines

National Pneumatic Door and Step Control

PLEASES THE PATRONS

Unfailing obedience to the patron's desire to board the car, together with the—

Rapid opening and closing of doors with gratifying speed, absolute safety and minimizing of the "door-open" interval in winter—

Are the immediate outward proofs of satisfactory service to the public.

Deeper, though less apparent to the eye, is the development of a more courteous attitude by the platform employees who, freed from the fatigue of physical effort, find the time to—

Think of the Passenger as a Customer because they are assisted by National Pneumatic Control

NATIONAL PNEUMATIC COMPANY INC.

50 Church St. New York

515 Laflin St. Chicago



J·P·CO. REG. IN U.S.
NOARK
PAT. OFF.
FUSE

Protect every second the equipment it takes months to replace

IF only the cost of a burned out circuit had to be considered, taking chances with fuses would at least be a personal matter. But now, when every equipment replacement takes away from the nation's war resources—when these replacements must come by railroads already too congested—it is not only good business to take advantage of good fuse protection, but it is a patriotic service.

No effort is spared to make "Noark" Approved Fuses the last word in precision; no precaution of inspection or test is omitted which will increase the certainty of their operation. Every step in their construction and filling is completed in one plant under one control.

The Underwriters' label of inspection and approval which "Noark" Approved Fuses bear is but additional evidence of reliability. Look for it whenever you need sure protection.

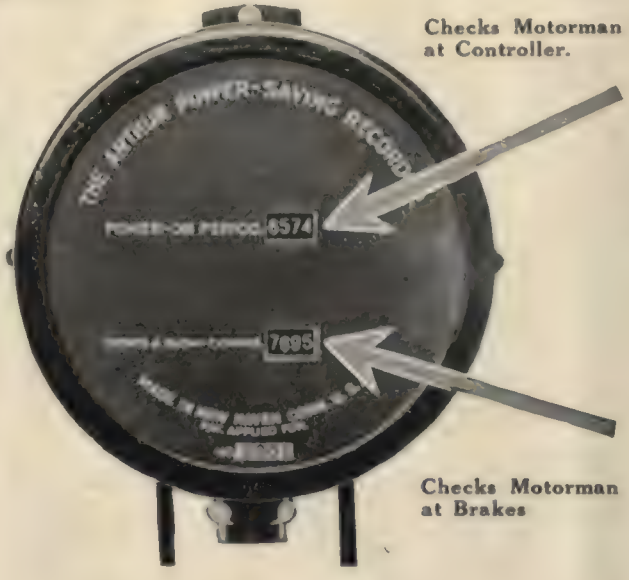
To the Trade: If you are not already stocking "Noark" Fuses, ask your jobber for the details of the sales policy designed for your protection.

H. W. JOHNS-MANVILLE CO.
New York City
10 Factories — Branches in 61 Large Cities

Manufactured by the Johns-Pratt Co., Hartford, Conn.
H. W. Johns-Manville Co., Sole Selling Agents

JOHNS-MANVILLE SERVICE
COVERS THE CONTINENT

JOHNS-MANVILLE



Mechanical Perfection *alone* can never produce the most efficient results in railroading

In every department of your property you may have the very best of equipment. In power plant, track, line, cars, everything may be of the very best and most approved design and quality. But if that equipment is not *properly used* there is bound to be loss and waste.

Maybe you have heard the story going the rounds about President Truesdale of the Lackawanna saying to an old engineer this winter: "Mike, why is it? We used to have just as hard winters as this—just as bad weather—but we used to get the trains in on time somehow and now we don't."

And Mike's reply was this: "Well, Mr. Truesdale, it seems to me, sorr, that in thim days we had cars of wood and men of steel, and now we have cars of steel and men of wood."

Maybe Mike was right and maybe he wasn't. But the point is clear just the same. It is the *human* element that counts most.

And that is where the value is shown of

The Arthur Power-Saving Recorder

It helps your men to cut your costs

Neither it nor any other device for a like purpose can cut your power costs by automatic action—by its own workings. But if you instruct your men *how* to run cars economically and *then* use the Arthur Recorder to record their care and skill you can get reduced power consumption, cut your costs for maintenance of equipment and get better, safer car operation.

These facts have been definitely proven.

The Arthur Power-Saving Recorder Co.

Second National Bank Building, New Haven, Conn.

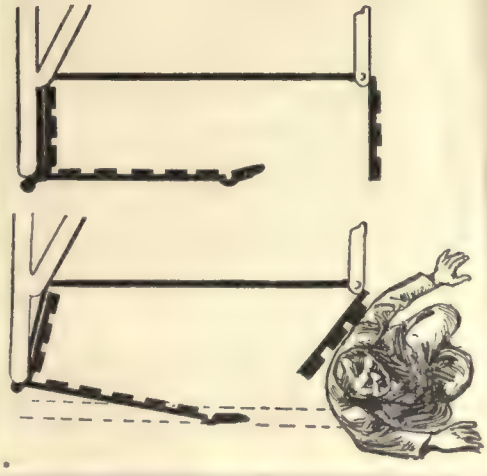




H-B Life Guards Prevent Accidents

Above we show a car equipped with H-B Life Guards in front of the County Court House at Pekin, Ill. H-B Life Guards protect the lives of the best brains in the country. They also protect the lives of the careless.

H-B Life Guards make serious front-end accidents most impossible. The protection is much greater than the cost. You simply cannot afford to be without H-B Life Guards on your cars.



The Consolidated Car Fender Co.

Providence, R. I.

General Sales Agent

Wendell & MacDuffie Co.

61 Broadway, N. Y.

DAVIS STEEL WHEELS



Utmost Dependability

and minimized wheel expense—the result of Davis Steel Wheels under your electric line equipment.

The hard, tough manganese steel in tread and flange offer resistance to impact to a wonderful degree, thus greatly reducing the danger of broken flanges on sharp curves and cross-overs, and rendering large mileage without turning.

AMERICAN STEEL FOUNDRIES
1100 McCormick Building CHICAGO





JOHNSON FARE BOXES
"Get the Money" in Denver

The Denver Tramway Company has placed its fare collection on a business-like basis that insures the maximum protection of its earnings by equipping their cars with Johnson Fare Boxes.

Read their own opinion quoted herewith:

> "They (Johnson Fare Boxes) have proven very satisfactory because they have not slowed up operation, they have lessened accidents, they have promoted a clean-cut business-like method of collecting fares and, finally, we get the money."
>
> The Denver Tramway Company.

There are now 345 Johnson Fare Boxes in service on their cars.

More than one hundred other representative railway companies are similarly equipped.

Can you afford to be without this up-to-date protection against loss of fares.

Let us help you analyze your special problems. Full details on request.

Johnson Fare Box Company

Jackson Boulevard and Robey St., Chicago

50 East 42nd Street, New York



Sir Goldsworthy Gurney built a steam carriage in 1828 that seemed to bear out the most optimistic hopes of early inventors. For four months, four times a day, this carriage made its nine mile trips in less than 50 minutes without an accident. Its career was brought to an end and the development of steam carriages practically killed when, due to the malicious plotting of the enemies of progress, the "Turnpike Act" became a law.

This act made the profitable operation of steam carriages practically impossible because it so restricted their speed on public highways.

The Railroad Reared Its Head from the Steam Carriage Ruins

—and with the development of travel by rail the need for the lumbering road carriage was no longer felt.

Smoother and speedier travel was the order of the day—and the railroads met the demand.

The rapid growth of the cities due to the quicker transportation offered by the railroads would not have been so readily possible had there not been concurrent expansion in the street railway field.

The rapid expansion of the electric railways of our cities has made possible the swift development of the world's centers—made it possible for the workman to enjoy a home miles away from crowded factory districts, for farm lands to be laid out in city squares; made possible the rapid transportation of farm products to profitable city markets.

In short, our electric railways have been, to a large extent, the prime factor in the growth of most of our cities.

Galena Oils

and Galena Service—have helped to make possible the increased speeds, longer runs and heavier loads of today, without which the present high efficiencies of our electric lines could not have been attained.

By developing a lubricant that gave a higher service efficiency than had ever before been thought possible;

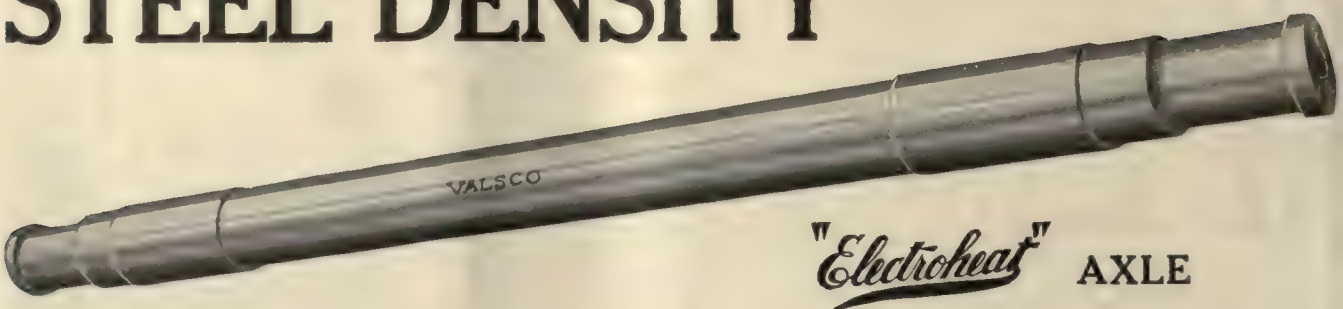
By creating a lubricating service that has helped railway men to solve problems pertaining to lubrication and helped them to improve lubricating methods, this company feels that it has been a real factor in the electric railway development of this country.

Today Galena Oils are the recognized standard lubricants for railway equipment—they have been for nearly 50 years.

Galena-Signal Oil Co.

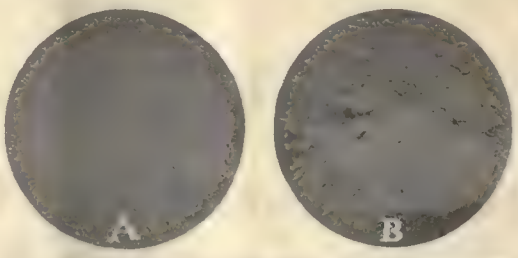
Franklin, Pa.

UNIFORM STEEL DENSITY



"Electroheat" AXLE

HAVING proper strength and toughness combined with high elasticity, the life of an axle subjected to repeated shock and alternating stresses, is greatly increased if the grain structure is **uniformly dense and highly refined.** In annealing, quenching or tempering there is an **exact** temperature at which each step should be carried on, and heating to any higher or lower temprature decreases the refinement of the grain structure without any improvement in the other physical charactristics.



Sections through a forged steel axle before and after electric furnace heat treatment process. Compare the course grain structure of the untreated steel (A) with that of the "Electroheat" steel (B). The absolute **uniformity** and **evenness** of the Electric Furnace Heat Process assures this highly refined structure throughout the entire axle—and enables exact duplication in unlimited quantity.

"Electroheat" Axles are heated in an electric furnace where the temperature control is positive and automatic and the heat absolutely uniform; resulting in the production of axles combining the densest and most refined grain structure with the proper strength, toughness and elasticity.

That's why the "Electroheat" Process in axle making minimizes service failures due to breakage, bending and excessive journal wear. A steel of uniform density throughout is absolutely assured. The process of heat-treating is **metallurgically right:**

NOTE: "Electroheat" Armature Shafts possess the same torsional and shock resisting qualities as "Electroheat" Axles, being heat-treated by the same process. They minimize service breakdowns and maintenance costs.

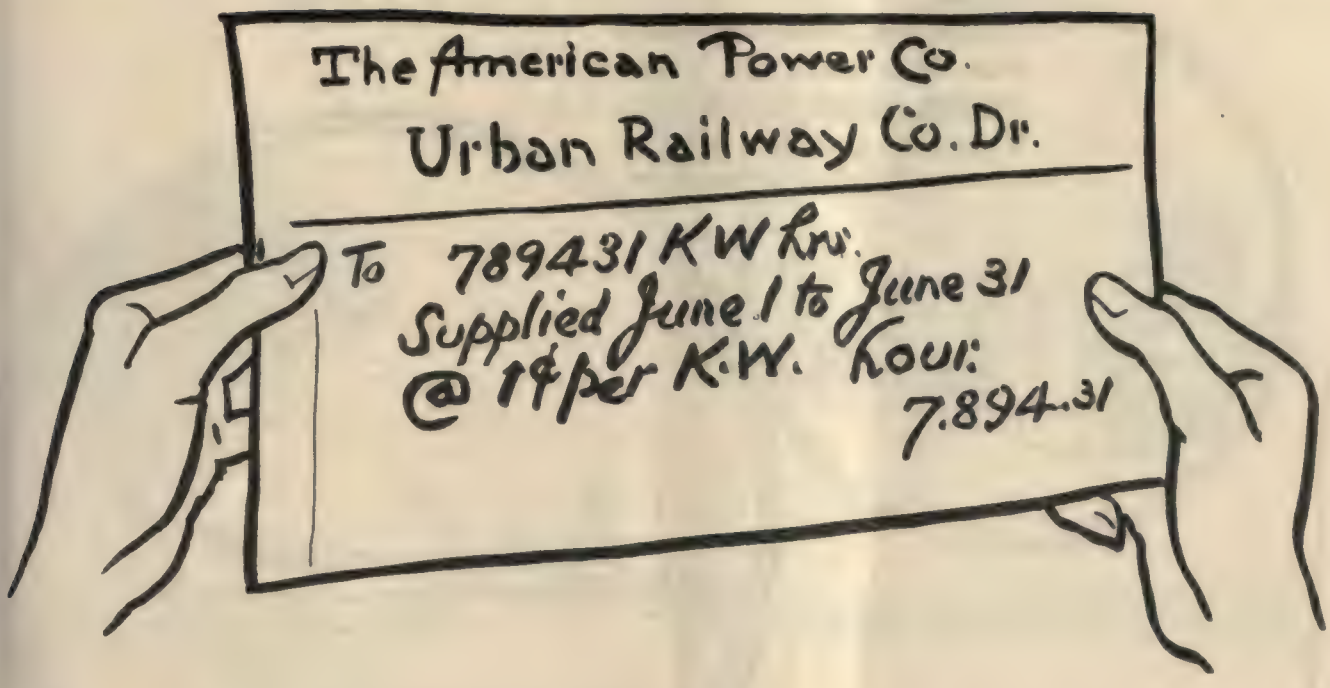
LOOK FOR VALSCO ON EVERY AXLE

"If Heat-Treated Electrically—It's a VALSCO"

LACLEDE STEEL COMPANY

General Offices, Federal Reserve Bank Building

Saint Louis, Mo., U. S. A.



Whether you generate or buy power

it is going to cost more and more in the future. Therefore, its correct use by the motorman is not merely a good thing—it is a vital question of surplus or deficit.

Rico Coasting Recorder



By providing your motormen with the *Rico Coasting Recorder* your power cost can be decreased in dollars as their COASTING TIME is increased in minutes.

Time is the Essence of Railroading

RAILWAY IMPROVEMENT CO. RICO 61 BROADWAY, NEW YORK



That's Logical, Isn't It?

What would it mean to you in dollars saved in a year if you were using

G-E Renewable Pan Frogs

Just think what this means as a time saver in cases of emergency.

No tackle necessary—simply loosen two bolts—unclinch the ends—slap on a new pan—tighten the bolts—clinch the ends and the line is ready for service—all done in two minutes.

Better consider them.

40-7

GENERAL ELECTRIC COMPANY

General Office, Schenectady N.Y. Sales Offices in all large citie

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 — New York, Saturday, June 8, 1918 — Number 23

Says a Public Service Chairman: "Play Fair on Skip Stops"

ELECTRIC railways never had a finer opportunity to give better service with existing equipment than is offered by the skip stop, but the opportunity must be accepted in the spirit of moderation and fairness. In fact, the way the railways handle this war-made situation will have much to do with the consent of commissions to further methods of alleviation."

The foregoing is the sense of what a wide-awake public service chairman said in private conversation lately. In his community the skip stop had been introduced successfully on the basis of about eight stops to the mile in the city, six to the mile in the suburbs and four to the mile in the country. Exceptions had been made according to local traffic peculiarities. On the whole the public was highly pleased, and the railways were able to give at least 10 per cent more service. To-day, the commissioner is very happy over results so mutually beneficial, but it was evident that he would not tolerate any withdrawal of cars so long as the present heavy travel continues. He made it clear that the keeping of faith means to the railway interests a mass of good-will worth countless thousands of dollars.

Who's Next for the Company Section Membership Trophy?

AT A WONDERFULLY enthusiastic meeting of the Rhode Island Company section held at Providence last Monday evening, M. C. Brush as vice-president of the American Electric Railway Association awarded the company section charter membership cup to that section. The cup will be held at Providence until another section is formed with a charter membership of more than 216.

The meeting was attended by a number of men interested in the affairs of the association and the industry from New York and Boston, who by their presence and remarks indicated that they realized the importance and significance of the award. There are already rumors of plans to capture the cup, and the local section officials generously said that while they appreciated the honor thrust upon them, in the interest of the industry as a whole they hoped they would not be allowed to keep it long.

In his presentation address Mr. Brush outdid himself as an orator in summarizing the essentials of success in the electric railway business, as in others. The chief of these, he said, is the ability to make and keep friendships, "capitalizing but not commercializing" them. These friendships are a necessary feature of a company organization and no better agency than the company section exists for fostering them. If this is so then the sooner more sections are formed the better, and they might as well be formed with more than 216 original members.

Who's next?

Electrical Operation Soon Over the Hell Gate Bridge

UNTIL the presentation of the recent New York Railroad Club paper by E. R. Hill, published in the March 23 issue of this paper, very little was generally known in regard to a piece of heavy track and overhead construction in New York City on which the Pennsylvania and New Haven Railroads were expending large sums of money. To be sure, the Hell Gate Bridge had attracted wide attention, due to the length and height of the span and to the beauty of the arch, but the relation of this bridge to the whole project was understood only in a very general way. Mr. Hill gave some data of the road and a description of the locomotive to be used, and these have now been followed by the descriptions of the overhead construction given in last week's issue.

It is, of course, unfortunate that the locomotives in this case must be equipped to draw their power supply from both alternating and direct current. The situation is in no way different, however, from that which confronted the New Haven engineers when first they selected single phase in spite of the necessity for bringing the trains into the "Grand Central Station" of the New York Central over the third-rail track. As far as the passenger terminal in New York is concerned, the New York Connecting Railroad might have been equipped with third-rail and direct current. In view of the future, however, when the line to Bay Ridge will be electrified, it is necessary to provide alternating current overhead so that the New Haven freight locomotives, which are straight single phase, can be used from New Haven to Bay Ridge.

For an "off" year in electric railway work the progress being made in 1918 in heavy traction lines is encouraging. The very extensive work on the Milwaukee, the Chestnut Hill branch work at Philadelphia, the improvements on the Norfolk & Western, the New York Connecting Railroad and the new locomotives which are to operate over it, etc., are all at least partly to be credited to this year. It is hoped that the federal railroad administration will find time to study this progress and to extend electric operation wherever it can be profitable under war-time conditions. It is safe to say of electrification as was until recently said of electrical engineering in general, that "it is still in its infancy." It is a husky infant, however, and needs only a fair chance to develop rapidly to maturity.

Bankers Have a Duty to Perform for the Nation

AN EFFORT must be made through ordinary banking channels to work out the salvation of electric railway financing. This is the meaning of the recent statements of the War Finance Corporation, as noted in last week's issue, to the effect that its resources are intended to be loaned directly to war industries only in exceptional cases and then upon adequate security.

Such an attitude presents a big problem to utilities. Of the $225,000,000 of securities maturing during 1918, $90,000,000 have already come due. In most cases, however, the refinancing has been held up pending decision on the question of governmental aid. This has now been settled in a disappointing way—a way which requires the utilities to take the most active steps to provide for their financial needs. No time should be wasted in wishing for a moratorium for utility issues. A general moratorium might not be injurious, but a special one on utility securities, inviting a most invidious comparison, would not only have a terrible effect now but would also leave such issues a marked class afterward.

Nor should each individual utility hope too fondly that it will come within the exception clause. Study the details of the one direct loan successfully secured by the United Railways of St. Louis—a six-months' loan for $3,235,000, supported by $3,500,000 of mortgage bonds and $800,000 of Liberty Bonds, and protected also by a fare increase to 6 cents. Read what the War Finance Corporation has just said about this: "It is a short-time loan, which, because of the high class of collateral secured, is certain to be liquidated at maturity, and the temporary relief granted by this advance will give the company opportunity to make permanent financial arrangements through regular banking channels."

The gist of the matter, therefore, is this. The Capital Issues Committee will scrutinize minutely all applications for approval of new capital, but even when its consent is acquired the government will probably not advance the money except in cases where the new construction is for its own immediate benefit. And for maturing issues, consent for the refinancing of which is not required, the government will give aid only in rare cases where the security is excellent, the term of the loan short and the prospect good that the banking assistance unavailable at the time will be forthcoming at the end of the period.

This puts the situation in all its large phases directly up to the banks. Undoubtedly some of them have in recent months shown a reluctance to handle utility business—a reluctance which has been manifested in demands for prohibitive interest charges. Now, however, their plain duty has been pointed out, and they should perform it with despatch. And, it should be added, they can make a profitable return. If a bank loans money to a utility at 8 per cent and then rediscounts 75 per cent of the loan at say 6 per cent, as it can do through the War Finance Corporation, the difference in interest payments will make a much higher return on the balance representing the bank's own advance.

The big handicap in getting banks to look upon utility financing as a desirable class of business is, of course, the inadequacy of present-day rates. As pointed out in detail later, we believe that the rate situation will have a more favorable aspect from now on. If the banks feel less optimistic, however, and deem it unwise now to tie up their reserves for long periods in utility enterprises, then the war finance corporation act will be a dead letter for utilities, and the government in the nation's interest will be obliged to consider amendments or new legislation. But this remains to be seen. What the utilities must do now is to make every effort to induce the banks to co-operate with the government for the preservation of the utility industry. No time should be lost.

Federal Government Can Raise Utility Rates for General Welfare

THE RATE situation, we believe, is picking up. This is most fortunate, for the question of adequate rates underlies the important topic discussed above, utility financing, and all other phases of the great work of serving the public. Why do we think the rate situation is improving? Because each week sees utilities here and there being granted higher rates? Partly. But in the main we feel as we do because we think men in the utility industry and the public outside are beginning to realize that utility rate-making is not of purely local concern and that the situation has assumed a phase which demands national attention and action.

Two noteworthy expressions of this idea have been made in the last few days, one by P. H. Gadsden before a gas meeting in New York and the other by the United States Railroad Administration. Mr. Gadsden raises a most interesting point—can the federal government authorize adequate rates for local utilities? While, as he observes, nothing is known of any disposition on the part of the Administration now to regulate rates, the question concerns a future possibility in regard to which the powers of the natural authorities are receiving increasing recognition.

Mr. Gadsden's argument can be briefly stated. It is that the power of the federal government over an industry in war time depends not upon the latter's participation in interstate commerce but upon its necessity, under the demands of war, for the nation's welfare. Thus even local industries can become so impressed with national characteristics as to place them within the sphere of federal control. In such an event the power of the national government, during the war and a reasonable time thereafter, is paramount, overriding ordinary state and municipal rights.

Electric railways and other utilities are war industries; their maintenance at maximum efficiency is necessary for the successful prosecution of the war. President Wilson and other leading men of the country have recognized this and have urged local authorities to grant relief. Unless these words of advice are heeded, it is not at all unlikely that the federal government may be obliged, as a last resort, to take such a step as Mr. Gadsden describes. If our memory serves us correctly, Congress during the Civil War period authorized an increase to cover the higher costs of operation.

If the federal government intervenes in this matter in the future, government control of service and other matters will undoubtedly not be desired, for the state regulatory authorities are better equipped to supervise

such features of operation. But if an expeditious uniform rate increase must be had, the nation may be depended upon to find a way.

If Interurbans Need Money, They Should Raise Rates Now

WE SPOKE above of the national concept of utility operation, and of the general need for higher rates. More encouraging than the growing recognition of what the national government may have to do to provide adequate relief, however, is the actual movement under way to secure increased revenues for one particularly deserving branch of electric railway service—interurban.

Most of the interurban electric railways have been in urgent need of higher rates, but as a rule they have not felt it wise to raise their rates above the steam railroad rates, which in many states have been restricted by law to 2 cents a mile. As a result, the interurban earnings have suffered severely. For example, a compilation made by the Electric Railway War Board shows that the net income of 127 interurbans in 1917 was only $9,816,180 as compared to $21,228,006 in 1913, a loss of $11,411,826. Moreover, twelve companies during the first quarter of 1918 reported a deficit of $533,000 as compared to a net income of $318,000 for the similar period in 1917.

Now, however, Director-General McAdoo with a wave of his magic wand has increased the steam railroad passenger rate to 3 cents a mile, and the interurbans have an unparalleled opportunity to secure adequate revenues. The increase in costs on the steam lines has been officially recognized by the government, and it certainly cannot be said that electric lines are not entitled to the same just treatment as the steam lines.

The government is not blind, however, and it sees clearly that present interurban rates are inadequate. Indeed, the situation is so evident that the United States Railroad Administration, through the Electric Railway War Board, has expressed the desire that electric railways take immediate steps to raise their rates proportionately to accord with those announced by the government and to make their new rates effective as nearly simultaneously therewith as is possible. It will support the effort of interurbans with the state commissions.

There will probably be certain localities where it may be expedient to depart from a fixed rule, but all deserving interurban carriers—and most of them are—should feel no hesitancy in asking for a 3-cent rate, or at least for such a rate as will maintain the former relation with the steam rates. As the War Board has pointed out, this is no time for vain dreams of profitable competition with the steam lines. Co-operation is the need of the hour, and there is business enough for all. It would be foolish for an electric road to start a competition in rates with the government.

The new steam passenger rates go into effect on June 10; the freight rates on June 25. Several interurbans are already filing higher tariffs, and most of them are expected to do so. All really in need should. If the state commissions understand the urgency of relief, as previously pointed out by President Wilson, no further support from governmental sources should be necessary.

Give a Company Money, and It Will Get Results

IS NOT the public-control plan for the Boston Elevated Railway a victory for the proponents of municipal ownership? Will the steam railroads ever go back under private control? These and similar questions which are frequently raised to-day in certain quarters are designed to make the unthinking public believe that the death-knell of private ownership and operation of railroads and utilities has been sounded.

But such is not the case. The idea that the public must take full charge of such enterprises as a matter of public necessity is nothing but the result of muddled thinking. Government ownership advocates seek to camouflage the issue, but the public will not be deceived.

What is the main issue? Simply this—that the rates paid by the public shall cover the full cost of service, including a fair return to the investor on the property in public service. The cost of service must be paid—no matter whether a utility is publicly or privately operated. Municipal ownership and operation will not decrease costs; indeed, if experience is any guide, such a system of control means wastefulness and inefficiency.

In the readjustment of railroad and utility operation to meet present abnormal conditions, therefore, the vital question is not who is operating the property but what will be paid to the operator. Under the Boston control plan, whose general principles have now been extended to the other Massachusetts roads if they wish to adopt the plan, the directors of a company, with the same provision for a flexible fare, could accomplish as much as will the public trustees.

In other words, the successful outcome of the Boston or Massachusetts situation will not at all be owing to the larger part played by the public in the operation of the facilities; it will be due to the revenue-producing mechanism which could not be used—or certainly could not be used so readily—by the companies while under private operation. Given the same opportunities and the same means, private operation will show better results than government operation. Given better opportunities and better means. the government may operate a commercial enterprise successfully, but this will be due solely to the better advantages and will be in spite of, not because of, the government control.

We believe that private ownership and operation will continue in America, but we also believe that the public interest in utility operation will henceforth be better protected. The co-operative or partnership idea governing the relations between the utility and its public will spread widely in the electric railway field; it is being advocated for the steam railroads after the war. Whether the closer relation will come through a more nearly perfect commission regulation, partial city representation on a board of control or sole city membership thereon will depend upon local conditions. The main point is that the credit of utilities must be restored by a sound and fair and farsighted rate system. As the utility operators have proved worthy of public trust, and as the needs of the utility do not demand heroic measures in the form of direct city aid, just so is the degree of public control likely to be minimized. The keynote of the future, however, will be participation, and in unity of interest and understanding progress should be made.

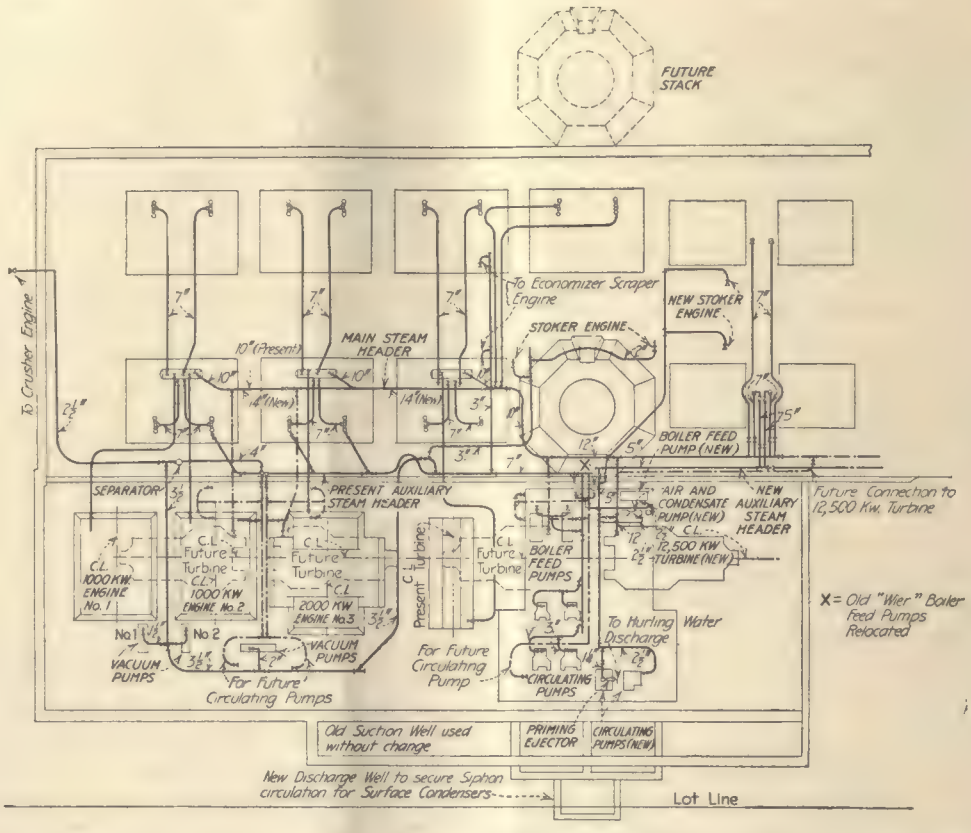
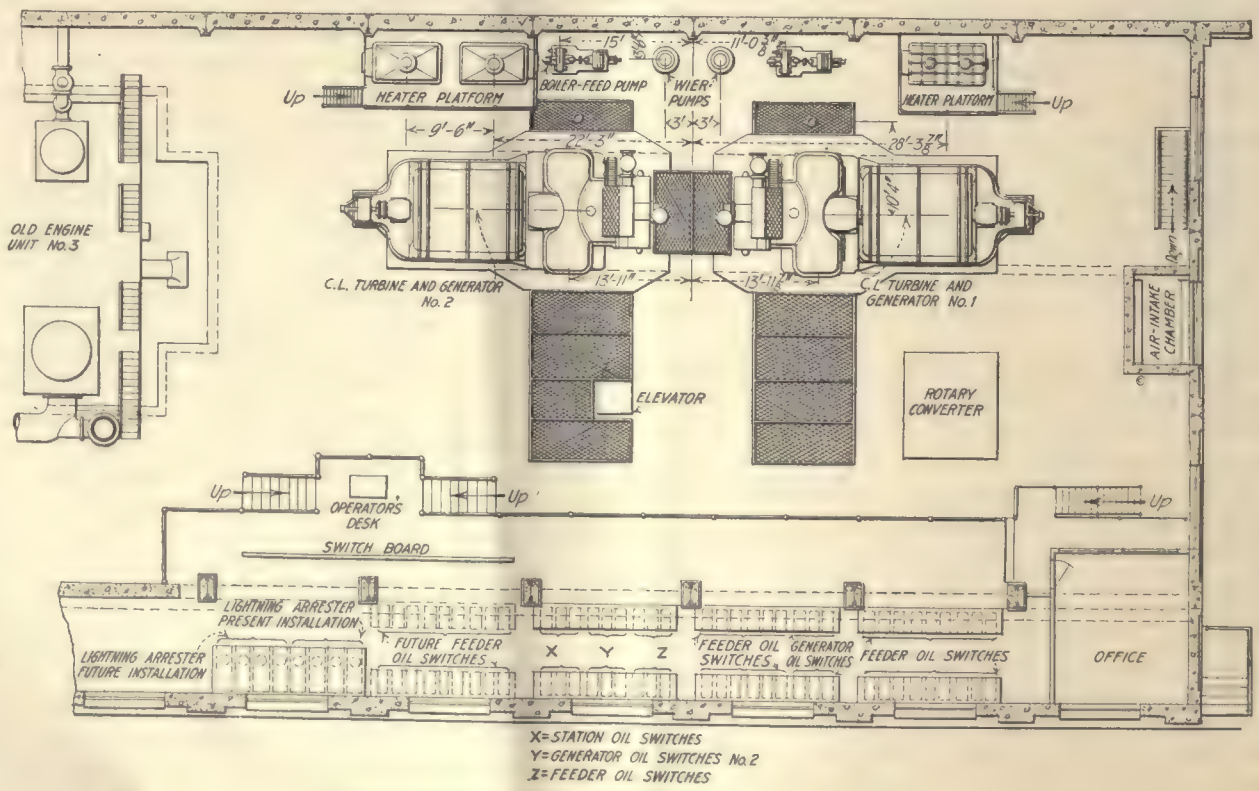


DIAGRAM OF STEAM PIPING WITH OUTLINE OF POSSIBLE FURTHER IMPROVEMENTS



PLAN OF STEAM TURBINE END OF ENGINE ROOM

Remodeling The Hochelaga (Montreal) Power Plant



General View of the Hochelaga Plant After Remodeling

THE CHANGES which are going on in the main power house of the Montreal Tramways, Montreal, Quebec, are typical of conditions on all progressive properties where obsolescence is forcing the retirement of engines which in their day were in the front rank of progress. Accompanying the changes in the engine room of this power house are others just as important in the boiler room and in the control and distributing section of the plant.

The relation of the Hochelaga power plant to the general power system at Montreal was outlined in articles printed in this paper on Jan. 12, 1918, page 72, and on March 9, 1918, page 449. On page 74 of the first issue mentioned was a brief statement of the changes in progress in the power plant itself. In the present and last of the series of three articles on the power situation at Montreal some further details and the engineering considerations entering into the rehabilitating process form the basis of discussion.

From the earlier articles it will be remembered that the Hochelaga steam plant was built in the eastern end of the city of Montreal in 1906 to take care of relay power requirements in the eastern and northern sections. It was built as a standby, the principal dependence of the Tramways for energy being upon the local abundant water power. The units which were installed at that time, two 1000-kw. and one 2000-kw. marine type compound McIntosh & Seymour direct-current sets, were model machines for the time. One of these machines can be seen in the background in a photograph reproduced on page 1089.

In the selection of the Hochelaga power plant for improvement as part of the general power rehabilitation plan, its convenient location with respect to circulating water for the condensers was an important consideration. As can be seen by reference to the map on page 73 of the Jan. 12, 1918, issue, the plant is located close to the St. Lawrence River. While not at the center of gravity of the power system it is within economical transmission distance of all the substations and, as it is to supply only relay power, the remoteness of location from the gravity center of the system is not important.

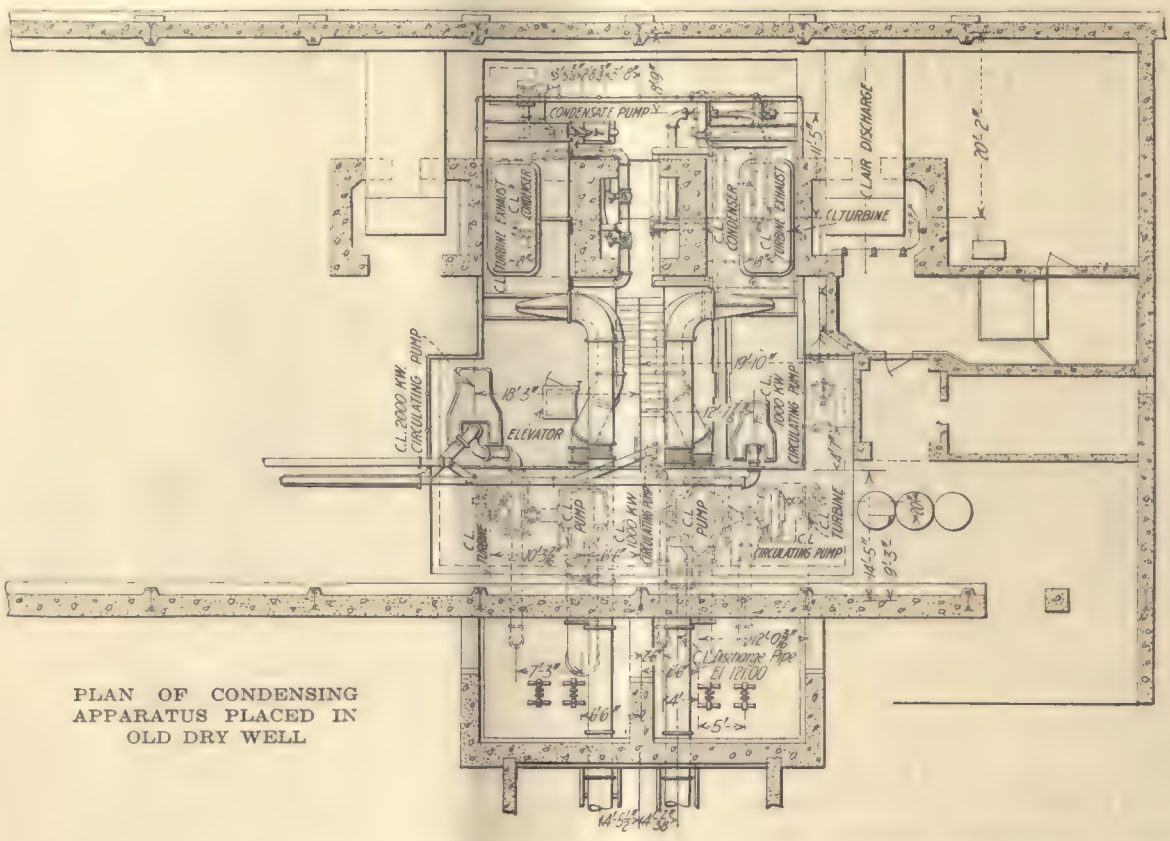
Turbines Are the Largest in Canada

The plant has been laid out for the final installation of four 15,630-kva. turbo-generators if it is desired to continue the development along present lines. At present one unit is in position and operating, while the second is in process of installation. These two turbines will take care of requirements for some time to come, and the detailed plans for further improvements will not be made for the present.

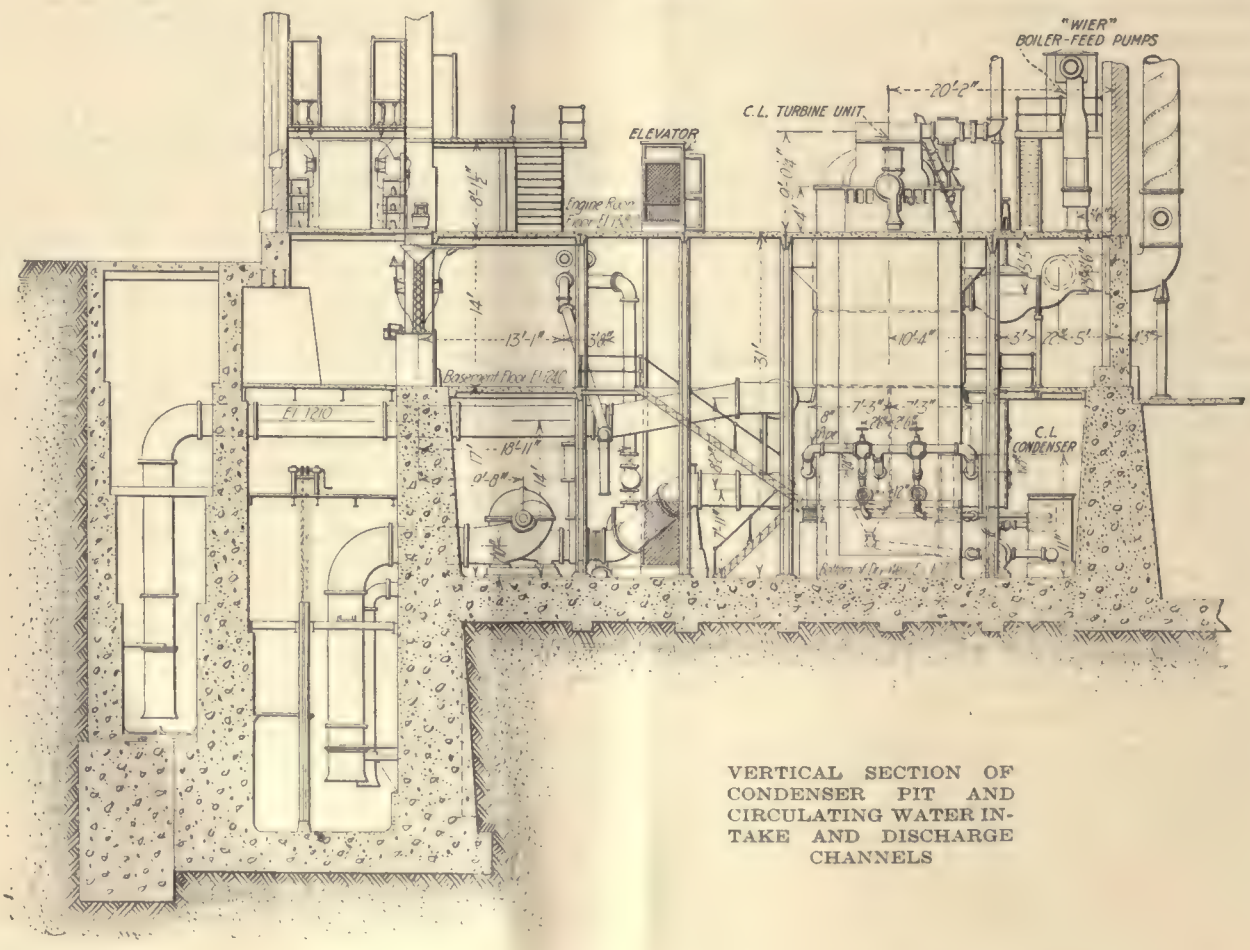
The present turbines are so far the largest that have been installed in Canada. As located they will furnish a striking example of the great increase in capacity and reduction in cost resulting from the use of turbo-generators. The accompanying boiler room changes illustrate also the development that has taken place in the last ten years in boiler and stoker practice.

Elaborating a little upon the last point it may be mentioned that the original designers evidently planned that the station should be symmetrical about the transverse axis through the dry well and chimneys. They probably did not intend to install more than two additional engine units of about 2000-kw. capacity each, making the ultimate capacity about 8000 kw. Now by extending the engine room a single bay, ample space has been provided for an ultimate development of 50,000 kw., or about four times as much, based on overload ratings of the engine sets for peak loads.

In the new work so far as practicable the rearrangement is being carried out on the unit plan, with respect to the apparatus serving each main turbine unit. Thus the boilers, heaters, feed pumps, condensing apparatus,



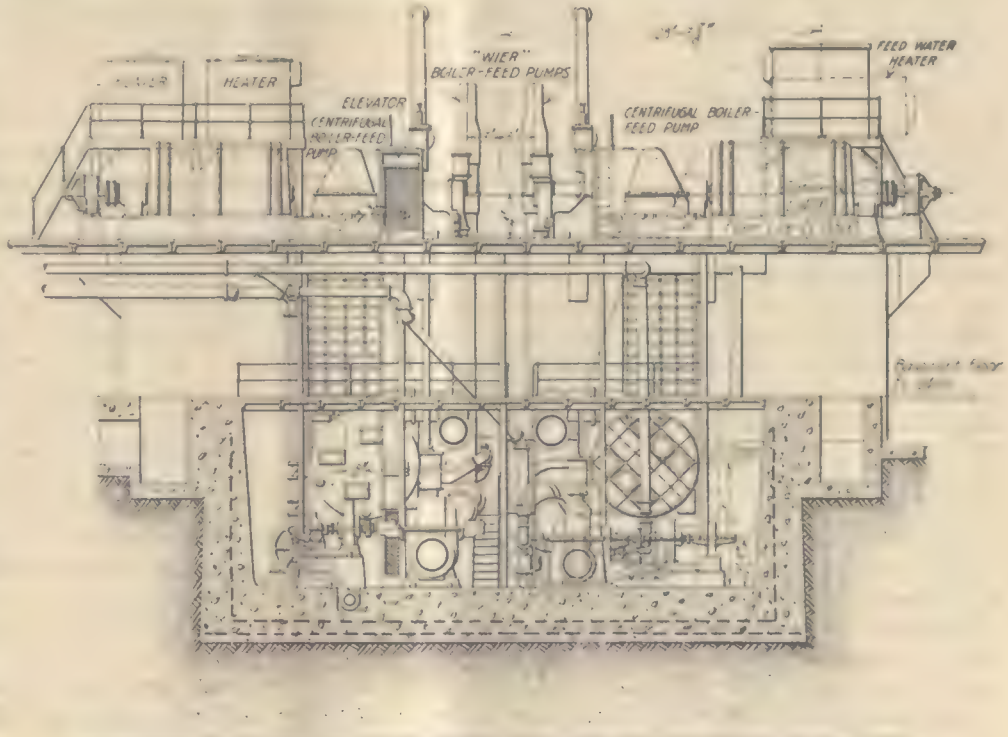
PLAN OF CONDENSING APPARATUS PLACED IN OLD DRY WELL



VERTICAL SECTION OF CONDENSER PIT AND CIRCULATING WATER INTAKE AND DISCHARGE CHANNELS

air washers, etc., will be installed in groups. This feature is illustrated in the drawing of the main and auxiliary steam piping, reproduced on page 1084. Incidentally this drawing shows how the engine room was blocked out in a general way with possible future extensions in mind, although as stated before specific plans for the future have not been made. A general plan was, however, considered desirable in connection with the installation of the first turbine so that the progressive steps should all form part of the final results with as little wastage as possible.

A number of drawings have been reproduced herewith to show the general layout of the turbine room and particularly of the auxiliaries. The turbine units are General Electric-Curtis machines producing three-phase power at the transmission voltage of 13,200. Thus no step-up transformers are required in connection with them. The water rate of the turbines at full load is approximately 12¼ lb. per kilowatt-hour when supplied with steam at 190 lb. per square inch pressure and 150 deg. Fahr. superheat. The foundation pier underneath the turbine end bearing is 31 ft. long and that underneath the generator is 14 ft. long. The latter has the usual form of a hollow box. The turbine pier is in the shape of a channel and is so designed that it could be united with a similar pier under the second turbine which will be adjacent, thereby also forming a hollow pier. However, the present foundation has proved so satisfactory that this provision for uniting with the other pier will not be made use of. Particular attention is directed to the arrangement for circulating the air from the turbines to the furnaces. In the turbine room plan, page 1084, is seen an air intake chamber which draws air from outdoors at a point about 8 ft. above the ground-floor level. The air passes through the turbine and is discharged into the boiler room basement behind the boiler foundations. This arrangement effectually muffles the noise and at the same time supplies warm air to the stoker blowers.



VERTICAL SECTION OF CONDENSER PIT SHOWING TRUNKS FROM TURBINE EXHAUST AND REINFORCEMENT OF DRY WELL FLOOR

SAVING ONE-HALF THE POWER IN CIRCULATING THE CONDENSING WATER

A study of the cross-section on this page will show an unusually deep location of the condensers. They are so located for the purpose of saving power in circulating the condensing water. The St. Lawrence River at Hochelaga has had a flood height of 123 ft. elevation and an extreme low level of 92.35 ft. elevation, a difference of nearly 31 ft. This accounts for the depth of the dry well originally constructed in the engine room to accommodate the circulating pumps for the barometric condensers of the reciprocating engines.

The principal problem met by the engineers in connection with the installation of the present and immediately prospective turbines was to make use of this dry well for the new condensing equipment so as to secure siphon circulation at all stages of the river. To have placed the condensing equipment in the engine room basement, as in the ordinary arrangement, would have entailed an extra pumping head of 20 ft., and would have required 250 hp. per condenser for pumping instead of 125 hp. and an annual cost for extra steam alone of at least $6000 based on operating one-half the time.

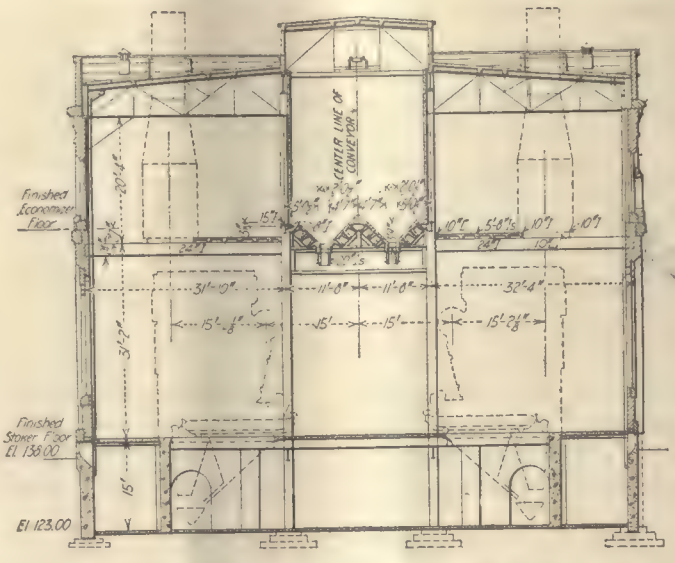
By the arrangement shown in the drawing, it was possible to obtain siphon circulation at a maximum pumping head of 22 ft. under the most unfavorable conditions, which would occur at extreme low water when two turbine units are taking circulating water through the existing intake and discharge conduits. This required the placing of the condenser nozzles 14 ft. below the turbine exhaust, with a cast-iron connecting trunk between, and the construction of a somewhat unusual foundation for the turbo-generator. It also required constructing a new discharge well just outside the old dry well and running a new discharge conduit at a lower level under the street to connect with the original conduit at its lower level.

The entire weight of this exhaust trunk and the condensers, and part of the circulating piping with the contained water, is carried on four sets of springs under the condenser feet. The details of this arrangement were carefully worked out for all conditions to avoid undue thrust on the turbines. This feature was cared for by the condenser manufacturer who supplied the springs and the jacking plates.

The total range of motion of the above-mentioned supported weight may be ½ in. As the piping connected

to the condenser is subjected to the same motion, the main circulating pumps are provided with multi-corrugated copper expansion joints. The smaller piping for air and condensate is designed to be sufficiently flexible by the use of bands.

Before we leave the subject of the dry well it may be noted that the pier which carries the weight of the turbine end of the unit rests on the dry-well floor. To distribute the load of this pier over the floor of the original dry well a heavily reinforced-concrete mat was installed in the bottom of the dry well covering the entire area below the condensers.



DIAGRAMMATIC CROSS SECTION OF BOILER HOUSE WITH DIMENSIONS OF PRINCIPAL FEATURES

The surface condenser used with the first unit, together with the necessary auxiliaries, is of Alberger make. A C. H. Wheeler condenser will be used with the second unit. These condensers and their auxiliaries are of standard types. In connection with them tanks are provided to supplement the feed water heaters to avoid overflow and loss of condensate. These tanks are so piped that the ordinary source of makeup is from the warm water discharged from the turbine bearings and oil cooler.

Novel Combination of Equipment in Boiler Plant

The particular combination of draft apparatus, economizers and stokers installed at Hochelaga is said to be the second of this particular type on the continent. It embraces a combination of the low-ejector type stack, steel tube economizers and chain grate stokers of relatively large grate area set in a furnace embracing the entire base of the boiler, that is, the full tube length and breadth. To provide for the increase in boiler capacity made necessary by the installation of the turbine units four 1100-hp. Babcock & Wilcox marine-type boilers were installed, and equipped with superheaters, economizers and ejector drafts, as just mentioned, the drafts being furnished by motor-operated fans. Still further to increase the boiler house capacity, the output of the older boilers is being increased by the addition of induced-draft fans, underfeed stokers replacing the present chain grates, etc. By these improvements the steaming capacity of the old boilers will be at least doubled, and better use will be made of the economizers which accompany them.

By extending the boiler house to its ultimate size and later adding another stack, and particularly by the removal of the chain grate stokers from the old boilers, ample steaming capacity will be available eventually to handle the peak load of 50,000 kw.

The rating of the new boilers corresponds closely to the maximum rating now commonly used in connection with turbo-generators and electrical apparatus. The rating of the unit corresponds to 1080 boiler horsepower on the Centennial rating. The heating surface of the boiler alone is about 5620 sq.ft. Disregarding the economizer this corresponds to 1.9 times the ordinary full-load rating of a boiler. For coal of 13,500 B.t.u. and 70 per cent combined efficiency of grate, boiler and economizer, the rate of combustion is 17 lb. per square foot of grate surface at the rating of the unit.

Both Motors and Turbines Are Used for Auxiliary Drive

To make good use of the economizers forming a part of the boiler units in supplying the first turbo-generator, it was important to restrict the amount of auxiliary steam. On the other hand it was desired to provide enough steam even in winter to maintain a feed tem-



PROGRESS PICTURE SHOWING EXTENSION OF POWER PLANT BUILDING



PROGRESS PICTURE SHOWING THE SEVERAL SECTIONS OF THE BOILER HOUSE



CONSTRUCTION VIEWS IN THE BOILER HOUSE SELECTED TO SHOW, AT THE LEFT, EQUIPMENT FOR FURNACE COAL SUPPLY, AND AT THE RIGHT THE STRUCTURAL STEEL FRAMING

perature well above the point at which injurious sweating would occur on the steel economizer tubes.

To meet these requirements both motor and turbine drives were used for auxiliaries. Some adjustment was provided to accommodate the summer and winter requirements, as well as variable load on the entire unit, by piping the exhaust from the turbine which drives the combined air and condensate pumps so that it may discharge to the open heater or into an intermediate stage of the main turbine.

CONTROL APPARATUS WAS PLANNED FOR THE FUTURE

The arrangement of the switchboard gallery in the Hochelaga plant before remodeling lent itself admirably to the addition of the alternating-current switching apparatus. The new arrangement can be seen in the turbine room plan on page 1084 and in the photographs on this page. For the circuit control General Electric motor-operated H6 switches were installed, and the usual modern arrangement of brick bus chambers, disconnecting gear, Tirrill regulators, etc., were provided. An Edison storage battery furnishes power for the remote-control power supply.

The main control panel was placed on the gallery opposite the operator's desk, while the switch gear was easily accommodated under the gallery. The direct-current feeder panels, seen in the photograph but not in the drawing which was reproduced to show only the improvements, were left undisturbed in their position on the gallery. The 600-volt d.c. busbars were formerly in the basement, but by a very simple rearrangement of floor levels they were placed above the switchboard thus minimizing the amount of copper required and getting the bars out of the way. In view of the possible ultimately large development of the plant oil switches of unusually large rupturing capacity were selected.

The turbine room contains a 2000-kw. steam turbine which has heretofore been used in connection with a rotary converter. Its voltage is but 2300 so that, to enable it to supply power to the high-tension system, it has been necessary to install a transformer to raise the voltage from 2300 to 13,200. A 3000-kw. unit is used for this purpose.

Power leaves the plant over No. 0000 three-conductor, round-conductor cable, with ⅛-in. insulation, and ⅛-in. paper jackets. This cable has a capacity to carry 4000 kva., which is the capacity of two substation units. This cable was fabricated by the Northern Electric Company, and in connection with it cable potheads of Standard Underground Cable Company's make are employed.

In concluding this series of articles on the power situation at Montreal it may be well to reiterate the



AT LEFT, SWITCHBOARD GALLERY WITH CONTROL PANELS IN THE BACKGROUND. AT RIGHT, ALTERNATING-CURRENT PANELS UNDER GALLERY

earlier statement that this work has been carried out in accordance with a comprehensive plan. Much of the transmission system has been placed underground in conduit of the best possible construction, attractive substations have been built with architecture designed to render them harmonious with their surroundings, provision has been made to utilize to the fullest possible extent the water power of the neighborhood, and finally the Hochelaga steam plant has been put into shape to furnish reserve power at the minimum possible cost.

All of this work has been carried out under the immediate supervision of W. F. Graves, chief engineer Montreal Tramways, with the collaboration of K. B. Thornton, consulting engineer, and the construction engineering department of the General Electric company. The installation of the second turbine in the Hochelaga plant, which is to be completed this summer, will practically finish the work contemplated for the present. It will round out the program which has been in progress for several years.

Rates and Wages Discussed at Iowa Convention

Iowa Association Holds Two-Day Meeting—Joint Meeting with N. E. L. A. on May 31—Officers Elected

THE Iowa Electric Railway Association held its annual convention at the Hotel Chamberlain, Des Moines, on May 31. There was no printed program and no definite papers were scheduled. The morning session took more the form of a round table discussion with interest entered on the topics of labor conditions and rates. The general opinion of the men assembled was that the only solution to the interurban railway problems was for the government to consider these roads as "affiliated railroads" with the steam lines, grant them the same passenger and freight rate increases and give them a proper amount of business but not take over their active operation.

During the discussion on wages, the representative of one property stated that men coming into the employ of his company signed an agreement not to join a union but that a few weeks ago the employees had become unionized. He mentioned that he had seen an article in a recent issue of the ELECTRIC RAILWAY JOURNAL stating that the Nashville Railway & Light Company, Nashville, Tenn., had been granted an injunction by the court to prevent its employees from unionizing and that his company was investigating to see what it could do in this respect.

During the discussion on fares it was proposed that rates should depend upon the amount of riding done by any particular patron, *e.g.*, that the basic rate should be 10 cents per ride for visitors and occasional riders, with, say, five rides for 25 cents for regular patrons and residents. The idea did not apparently receive favor, as it did not bring forth discussion.

RATE INCREASES

The afternoon session was held in unison with the Iowa Section, N. E. L. A., holding its convention at the some hotel on May 31 and June 1. The topic was a discussion of rate increases, led by F. A. Warfield, rate specialist Illinois Traction System, Peoria, Ill. Mr. Warfield spoke at length on four points, *i.e.*, the national aspect of the present conditions under which utilities are operating, the peril of the situation to the utilities, the extent to which the local communities shared a rate increase equally with the utility and the fact that present conditions are a test of commission regulation. Mr. Warfield believes that valuation should be dispensed with at this time in the consideration of fare increases.

Speaking of the Illinois Traction System, some of the points brought out in the discussion were that increases had been requested for electric, gas, heating and railway service in every town in which this company operates, that in the matter of emergency increases every request had been granted in full with the matter of valuation and appraisal waived, but that to obtain permanent increases, valuation and appraisal had been requested with a financial report covering the past five years. A 6-cent fare has been granted in these towns and is being sought in two others, while the company is considering asking for an 8-cent fare on one property. Increase requests are based on a percentage depending upon the service requirements of the town, a 7 per cent return being held necessary on the investment over and above 4½ per cent for depreciation. Upon being questioned, Mr. Warfield unhesitatingly stated that his company much preferred the commission regulation of Illinois to the municipal regulation of Iowa.

OFFICERS ELECTED

Following the joint session the following officers of the Iowa Electric Railway Association were elected: President, C. E. Fahrney, general manager Ottumwa Railway & Light Company; vice-president, F. J. Hanlon, general manager, Mason City & Clear Lake Railroad, Mason City; secretary and treasurer, H. E. Weeks, secretary Tri-City Railway & Light Company, Davenport.

Don't Help the Kaiser

THE Northern Ohio Traction & Light Company, Akron, Ohio, has recently been using a series of sixteen patriotic safety posters as part of a city safety campaign. The safety director of the city asked the company to help secure better observance of the traffic laws. Through the civic committee the company procured prints of accident drawings and E. Burt Fenton, publicity agent of the company, wrote the text.

It was generally agreed that all of the publicity matter should have a patriotic tinge. Accordingly such slogans as the following were used on the cards:

"It cost Uncle Sam his [the pedestrian's] services for a long time and helped the Kaiser that much. Don't gamble with your life!"

"While he was laid up he was aiding the Kaiser. Be your own traffic cop."

"The Kaiser welcomes all these little accidents as a first aid to autocracy. Why play his game?"

"The Kaiser was pleased when they all went to the hospital—except those the undertaker got. Avoid close shaves."

The cards were placed in the street cars of Akron and most of the interurban cars running into the city. A little later the same series will be used in Canton and Massillon.

Federal Government Can Raise Utility Rates*

Under Welfare Clause of Constitution, Washington Has Paramount Power to Regulate Local Utilities Because of Their National Essentiality Under War Conditions — Banks Should Not Shirk Duty of Financing Utilities

BY P. H. GADSDEN
Resident Washington Member American Electric Railway Association War Board

THE whole war program for which the industries of the country are now mobilizing is predicated on continuous and, in most cases, increased service from the public utilities. This fact has just begun to be recognized by the general public.

The electric, gas and transportation utilities must be relied upon absolutely to furnish:

1. The increased demand for power, heat and light.
2. At least 20 per cent of the toluol necessary for the prosecution of the war.
3. An important short-haul freight service to relieve the congested steam railroad conditions at terminals and industrial centers, together with more transportation facilities for the new army of workers engaged in the industrial cities being established by reason of war demands. More than 80 per cent of factory employees are now being transported daily by street and interurban railways.

NATIONAL USE MEANS NATIONAL REGULATION

The fact that the operations of any industry under the exigencies of war have become essential to the nation's welfare immediately impresses upon that industry a national character and justifies the federal government in exercising the federal power to regulate and control. To state it differently, the power of the federal government over an industry in time of war rests not upon the fact that such industry may or may not be engaged in interstate commerce, but upon the more comprehensive basis that such industry, under the demands of war, has become necessary to the nation's welfare. When such a situation has been created, the power of the federal government, certainly during the period of the war and for a reasonable time thereafter, is paramount to that of the state.

In pursuance of these general principles, we have seen the government progressively fix the prices of wheat, milk, sugar, etc., through the Food Administration; of anthracite and bituminous coal, and coke, through the Fuel Administration; and of pig iron, aluminum, steel, cement, lumber, hides and leather, and a large number of other basic articles, through the price-fixing committee of the War Industries Board. Within the last few days a Textile Administrator has been appointed, with large powers over the entire textile industry of the country.

Prior to the war the federal government did not possess the power to regulate the prices of these articles. How then has it been derived? From the increasing necessities of the situation. As each article in turn becomes more and more necessary to the nation's welfare and more and more intimately connected with the prosecution of the war, it comes within the sphere of federal control and becomes impressed with such a national character as to justify the national government in regulating and controling it.

I am not at this time making a plea for government control of public utilities. Personally, I think that such action on the part of the government should only be taken as a last resort after all other measures of relief have first been tried. I am seeking to direct attention to the fact that the power exists both to fix rates and to control the operation of public utilities.

We have seen both powers exercised by the government in recent months. In the case of coal, copper, sugar, aluminum, tinplate, etc., the necessities of the situation have up to this time been satisfactorily met by fixing the price. On the other hand, in the case of the railroads, we have the most striking illustration of the inadequacy of the regulation by price fixing. When it became apparent that the regulation heretofore exercised by the government did not meet the situation, the government unhesitatingly took the next step deemed necessary fully to meet the needs of the war program.

While so far as I know there is no disposition on the part of the Administration at this time either to take control of utilities or to regulate their rates, I think there is a growing recognition of the fact that the power to do so exists under the Constitution. If in the future conduct of the war the interests of the nation should make either course of action necessary, I do not believe there will be any hesitation on the part of the government to act. Whether such action should be taken by the government will, and should, depend solely upon the needs of the nation as they develop from day to day in the prosecution of the war. The necessity will create the authority to act.

NATION-WIDE MOVEMENT FOR HIGHER RATES

The recognition by the President and the Secretary of the Treasury of the intimate relation of the gas, electric railway, and electric light and power industry to the whole war program, with the establishment to their satisfaction that the operations of these utilities are essential to the nation's welfare in time of war, has encouraged a nation-wide movement for increased rates. The United States has been divided into eight districts, and in each district a regional committee has been appointed to present to the public service commission in each state the critical condition of public utilities, the essential nature of their functions to the whole war program and the imperative necessity for increased rates from a national viewpoint.

*Abstract of address delivered in New York on June 6 before joint meeting of American Gas Institute and National Commercial Gas Association, called for purposes of amalgamating these associations into the American Gas Association.

Such representations have already been made before commissions in a number of states, and there has been a gratifying response on the part of some of the commissions. In non-commission states, committees have been appointed to present the situation to the governors and to the state Councils of Defense, Chambers of Commerce and municipal bodies. Here, too, the efforts have met with a considerable measure of success.

The results, while encouraging, are not sufficiently general to afford the relief required. There is no doubt that many companies will fail to secure the necessary increases of rates unless the national government is willing to come more directly and practically to their relief. In his letter to Secretary McAdoo, the President, evidently anticipating just such a situation, said:

"I shall be glad to have you communicate with the local authorities whenever the information in your possession suggests that such a course is desirable and in the national interests."

We are still in hopes that the action not only suggested but authorized by the President will be put into execution. If the wishes of the President can be brought directly and officially to the attention and consideration of the regulatory bodies of this country, there will no doubt be prompt and cheerful response on their part.

In this connection, it is interesting to note the attitude of cities as to rates of municipally owned and operated utilities. It has not been practicable to secure a complete list of all increases in such rates, but records show that more than seventy municipal plants have already made substantial increases.

Banks Have Financing Duty to Perform

Utilities have for months been looking forward to the organization of the War Finance Corporation to afford relief in financing maturing obligations, and in securing new capital required to make enlargements and additions made necessary by the war program. It was confidently expected that public utilities as a class would be recognized as coming under Section 9 of the act and be treated as an "exceptional case," and that the directors would feel authorized to make direct loans to them.

We have been greatly disappointed over the construction placed upon this section of the act. The directors in a statement on May 28 set out the policy and the purpose of the act as construed by them. [ELECTRIC RAILWAY JOURNAL, June 1, page 1069.] This means that little, if any, aid can be expected by direct loans, and that public utilities must seek advances from the banks to take care of their maturities.

There is an impression in Washington that public utilities have not exhausted their efforts through the ordinary banking channels. The board is by no means satisfied that the necessary accommodations cannot be secured from the banks. It is incumbent upon utilities, therefore, to make every effort to induce the banks to co-operate with the government in assisting companies to protect maturing obligations, and, in turn, getting assistance from the War Finance Corporation under Section 7 of the act. In this connection the banks of the country have a plain duty to perform which they cannot afford to shirk and which in proper and meritorious cases they will not be allowed to escape.

Should it prove to be impracticable to obtain the necessary relief from the banks under Section 7, and it is further established that a *bona fide* effort has been made by the public utilities along those lines, then consideration will have to be given by the banks, the companies and the government to such amendments of the act as will afford the relief which the act was intended to provide and which the necessities of the situation absolutely demand.

Lessons To Be Drawn from the Present Situation

1. The present system of rate regulation has broken down. It was admittedly designed to regulate rates downward, and it is not adapted to granting prompt relief to meet violent changes in operating costs. Under conditions which existed before the war, the costs of labor and material were looked upon as a constant factor, and the only variable factor recognized was the capital employed. No provision was made for unusual variations in the prices of labor and material. After the war we should strive for and insist upon some system of rates more quickly responsive to conditions—some system which, under definitely fixed conditions, will work automatically.

2. We must, as far as possible, retain the community of interest which has been brought about by the war. We must recognize that the fixing of rates for a given company in a particular state is a matter common to all public-utility interests in that state and should not be left to be handled alone by the industry affected.

3. We must preserve the national aspect and character which is now so generally recognized. After the war, our efforts should be directed to impressing upon the public mind that we are just as essential to the social, economic and industrial life of the community in peace as in war, and that the maintenance of public service facilities in a high state of efficiency is a necessary part of the preparedness of the nation, not only for war hereafter should it come, but also for the great industrial strife certain to come when this war is over.

Guarantee versus Regulation

Mr. Mortimer Discusses Massachusetts Plan—Would Not Be Surprised if Federal Government Took Over Power Systems

STATE ownership or guarantee of the integrity of public utility investments must come if the properties are to continue to grow and meet the needs of the communities served. This is the opinion expressed by J. D. Mortimer, president North American Company, following a decision by the Wisconsin Railroad Commission granting an increase in fare to 5 cents for the subsidiary city lines in Milwaukee but failing to grant relief for the suburban lines. A summary of this decision is published in the news section this week.

Commissions Are Working Themselves Out of Jobs

Mr. Mortimer is quoted as follows:

"The more I see of regulation, the more convinced I am that the commissions are rapidly working themselves out of their jobs. Regulation seems to satisfy the politicians as long as the tendency of rates is downward, but regulation apparently becomes entirely unsatisfactory to these same people when regulation of rates is upward. For the purposes of political dis-

(*Continued on page 1093*)

Service-at-Cost Offered to all Massachusetts Electric Railways

Legislature Enacts Measures Providing for Public Control of Bay State Street Railway and State Directors of Other Roads Accepting Service-at-Cost Plan—Membership of Public Service Commission Reduced from Five to Three

FOLLOWING close upon the passage of the Boston Elevated Railway public control act, accepted by the stockholders on June 3, the Massachusetts Legislature enacted two measures of great importance to the other electric roads of the state and established a basis for service-at-cost operation throughout the commonwealth. A special act (Chap. 188) provides for the public control of the Bay State Street Railway, and another new law (Chap. 280) offers all other electric lines in the state an opportunity to accept state supervision combined with service-at-cost, but without the same full management by representatives of the public which is provided in the Boston Elevated and Bay State cases.

Bay State Public Control Act

The Bay State public control bill provides for the organization of a new company to acquire the property of the present company at a judicial sale or otherwise, provided the plan is approved by vote of a majority of the directors and two-thirds of its stock. The new company is to be managed by five trustees appointed by the Governor and approved by the Executive Council. The trustees and their successors are to control the road for ten years, and each is to receive an annual salary of $5,000. To pay for the property of the Bay State company, the new company may issue securities, but they shall not amount in the aggregate to more than the investment value of the property, as given in the decision of the Massachusetts Public Service Commission dated Aug. 31, 1916, nor shall they represent an annual interest and dividend charge (common stock dividends being computed at the rate of 6 per cent) in excess of 6 per cent upon $40,282,340, plus such amounts as may be determined by the commission to have been additions or improvements since the above date. The commission is to make further adjustments of the rate base which will represent present values on a 6 per cent basis of all rentals on account of street railway property leased by the company and included in the above computation. The value of any property sold or otherwise disposed of by the receiver prior to the organization of the new company is also to be deducted by the commission.

The new company is authorized to issue serial mortgage bonds not to exceed $5,000,000 at any one time outstanding, payable in instalments within ten years. Amounts deducted from earnings otherwise applicable to dividends and applied to the redemption of serial bond instalments are to be capitalized in the form of common capital stock of the new company issued at par and distributed to stockholders to the extent that the stockholders do not receive such dividends in cash. Such shares are to take the place of serial bonds. The new

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cussion, it is unwise for an office holder to admit that public utilities are subject to the same economic laws as the grocery store, the coal yard or the manufacturing plant; that is, that the selling price of the product should increase with the cost of production.

"Inability to procure promptly increased rates made it necessary for the State of Massachusetts to assume responsibility for the operation of the Boston Elevated Railway, and the same causes resulted in the receivership of the Bay State Street Railway and the formulation of legislation providing for its reorganization and the guarantee of returns by the State. Regulation is undergoing the same experience in other states. I agree with Mayor Hoan [of Milwaukee] that the present condition is decidedly unsatisfactory, but my remedy is different from his in that I advocate state ownership rather than municipal ownership.

Federal Government May Take Over Power Plants

"It would not be surprising if the federal government took over first the control and later the ownership and operation of the central electric power systems in all the States. Many power companies are interstate in character, and the tendency is toward complete interconnection of power supply and transmission systems. Electric power is now used so generally for motive-power purposes that it is one of the industries most essential in the conduct of war. Its control by the federal government is probable, particularly in view of the coming electrification of steam railroads.

"In order to permit state ownership of electric railways and gas companies, a constitutional amendment would be required; that is, an amendment that would permit the state to pledge its credit to procure the money necessary to acquire such utilities and to provide for their expansion.

Not Optimistic About Suburban Lines

"I am not very optimistic about our ability to continue to operate the suburban lines with the present rates of fare. The increases in operating expenses have been such as to leave a deficit in earnings on these lines without providing any interest on the $1,500,000 which we have there planted. I am afraid that the plans upon which I was working in an attempt to continue the operation of these lines are not likely to mature.

"We are calling the attention of the public to the essential facts so that they will be able to judge and express their opinion as to whether they want the lines continued in operation."

company cannot acquire the Bay State company until the trustees are satisfied that provision has been made for the paying in of $1,000,000 in cash by the holders of shares of the new company for rehabilitation of lines or other corporate purposes and for the immediate issue of serial bonds to the amount of $2,500,000. From the proceeds of such sale $500,000 is to be set aside as a reserve fund and $2,000,000 is set aside to be expended by the trustees in additions, improvements or in the payment of receivers' certificates or notes for such purposes. Serial bonds to the additional amount of $1,500,000 may be sold in the discretion of the trustees.

Financial Aid of State Provided

If the earnings of the new company otherwise applicable to dividends are not sufficient to redeem the instalments of the serial bonds, not exceeding $4,000,000, as they mature, the trustees will make up the deficiency out of funds received from the State Treasurer, who is required to purchase from the trustees an amount of serial bonds equal to the deficiency. The bonds so purchased are to be held for the benefit of the municipalities contributing to their purchase price. In case the treasurer of the state is called upon to purchase any serial bonds, the amount is to be contributed by cities and towns in which the new company operates. Pending such purchase by the State Treasurer of serial bonds, the trustees may borrow the money necessary to enable them to pay maturing instalments of serial bonds. The amount due for contributions by cities and towns for the purchase of serial bonds is to be added to the state tax next thereafter assessed upon the municipality, and the municipalities are authorized to borrow beyond their statutory debt limit to meet the assessment, provided the money is borrowed upon terms which will permit repayment on or before the maturity of the serial bonds.

The trustees have the right to fix fares, regulate transfers, determine the character of service and its extent, and in general operate the property after the manner of the usual board of directors, and without being subject in these respects to the Public Service Commission or any other state board. Provision is made for public hearings by the trustees, or by one trustee, in cases of service complaint. No contracts for the construction, acquisition, rental or operation of any additional lines or for the extension, sale or lease of existing lines can be entered into without the consent of the board of directors, unless, after such consent has been refused, the Public Service Commission determines that public necessity and convenience require such a contract and that the return on outstanding securities will not be impaired. In case of such determination the directors have the right of appeal to the Supreme Court of Massachusetts.

Flexible Fares Provided

The trustees must fix such fares as in their judgment will provide sufficient income to meet the cost of service, which is to include proper maintenance and all other operating expenses, taxes, rentals, interest on bonds, serial bonds and other interest payments and stated dividends on the preferred stock and 6 per cent on the common stock of the new company, such allowances for depreciation, obsolescence, rehabilitation, losses in respect to property sold, destroyed or abandoned as they may deem adequate or as may be required by the Public Service Commission, and all other lawful charges against income or surplus. They must also after a public hearing from time to time adopt and publish a schedule of at least four different grades of fare of which at least two shall be above and two below the schedule then in effect. The lines of the company north and south of Boston are to constitute two fare districts. The aggregate of the items entering into the cost of service of the new company is to be allocated by the trustees between the two districts for the purpose of estimating the basis for rates and fares. After notice and hearing the trustees are to make such further division of the two districts into smaller fare districts as they may deem reasonable and such further allocation of the aggregate of the items among the smaller districts as will in the trustees' judgment fairly distribute the aggregate so as to avoid as far as is consistent with the public interest and reasonably practicable the inclusion of such items in the computation of service cost in any fare district as may properly be laid upon territory outside of such a district. The trustees may from time to time after notice and hearing revise any such fare districts.

Any city or town by majority vote may from time to time for the purpose of preventing increases in fares or of reducing fares or of avoiding discontinuance or reduction of service enter into an agreement with the trustees in accordance with which the city or town is authorized to contribute, during the period of the war and for two years thereafter, to the cost of service any part or all of the increase in the cost of operation due to increased wages or the cost of supplies or coal, in excess of the average cost for the year ended July 1, 1914, as determined and apportioned by the trustees, provided that the contribution of a city shall not in any one year exceed the sum of 50 cents per $1,000 of the preceding year's assessed valuation and that such contribution of a town shall not exceed $1 per $1,000 valuation. If part only of the municipalities in any fare district contribute to cost of operation in this way, the trustees may make such fare adjustments as appear equitable.

Use of the Reserve Fund

The reserve fund is to be used for the purpose only of making good any temporary deficiency in income pending an increase of fares, and until such use may be invested at the discretion of the trustees. Excess income above the cost of service is to be added to the reserve fund.

If, at the end of March or any other quarter year, the amount of the reserve fund shall exceed by 50 per cent or more the amount originally established, plus such increases as may be made under the act, and during the preceding three months the income shall have exceeded the cost of service, the trustees are required, within thirty days, to put into effect a lower schedule of rates, and vice versa. The rates are to be decreased or increased quarterly as the amount of the reserve fund is above or below these limits. If in the discretion of the trustees it shall become advisable to increase the reserve fund at any time the trustees are authorized to

do so by the sale of securities, and the trustees are authorized, subject to the approval of the Public Service Commission, for the purpose of preventing undue increases of fares during the period of abnormal prices caused by the present war, to postpone making amortization charges and charges against earnings to cover depreciation until such period not exceeding one year after the termination of the war as they may fix.

After the expiration of the ten-year period of management and operation by the trustees the company is to have all the powers and restrictions of a street railway organized under the general laws and it must be willing to sell to the state or any political subdivision thereof at any time during the period of public control its entire property. The new company during the period of the war and for two years thereafter is not to be required except with the express approval of the Public Service Commission after a hearing to pay any part of the expense of the construction, alteration, maintenance or repair of any highway, street or bridge or structure maintained upon it, or of the abolition of any grade crossing or removal of surface wires to underground locations, although the usual cost of street opening for company work is to be met by the company.

No shares or securities of the new company are to be held by the Massachusetts Electric Companies or similar voluntary association for more than four months after the transfer of the Bay State property and franchises to the new company. The Supreme Court is to have jurisdiction in equity to review and modify or enforce order or rulings of the trustees.

SERVICE-AT-COST BY OTHER COMPANIES

The general service-at-cost bill as enacted is available to all electric railways in the State, except the Boston Elevated and the Bay State companies. Cost of service includes: operating expenses, taxes, rentals, interest on all indebtedness, dividends on preferred stock, 6 per cent interest on the stock investment as determined by the Public Service Commission, and such allowance for depreciation and obsolescence as may be fixed from time to time in the case of each company by the commission, and all other expenses and charges which, under the I. C. C. classification of accounts and under the laws of the State, are properly chargeable against income or surplus. "Capital investment" is defined as the amount of cash or fair value of the property paid for in securities and properly expended for capital purposes, such amount to be determined by the commission; but if the commission has approved the security issues, no further determination in regard to capital investment is necessary.

No company may accept this Act until it has provided a reserve fund of not less than 6 per cent or more than 12 per cent of the gross earnings of the preceding year, except as otherwise provided. This fund may be provided by the issue of securities. The reserve fund must at all times be segregated and used only for making up a deficiency of income, when the income of the company is insufficient to pay the cost of the service. The reserve fund may be invested in United States, Massachusetts State or municipal bonds. The reserve fund must be fully subscribed for upon acceptance of the act by the company concerned but must be paid in not more than two years, as directed by the commission. Any company may furnish a larger reserve fund with the approval of the commission.

Any company desiring to accept the Act (Chap. 280, 1918 Legislature) is required, at the time of its application to the commission, to determine the amount of its stock investment, to apply to the commission also to determine the status of its then unfunded debt. The commission thereupon is required to disallow any amount which, in its opinion, was improperly incurred. Interest charges upon the debt so disallowed are to be borne by the company and charged to the amount which would otherwise be available as a return upon the stock investment. Interest charges upon the residue of the unfunded debt are to be included in the cost of the service.

When the income is less than the cost of service, the reserve fund is to be used to make up the deficiency, and if the cost of service is less than the income, the excess automatically becomes a part of the reserve fund.

Any company accepting the Act must file, with its acceptance, a schedule of nine different rates of fare and of transfer privileges. One such grade is designated as the initial grade which it desires to establish and which will, in its opinion, enable it to earn an income sufficient to meet the cost of servce. Four other grades are to provide for progressive increases and four for progrssive decreases in revenue, and each interval of increase or decrease must be calculated to increase or decrease the revenue by 30 per cent of the normal reserve fund. Within thirty days thereafter and after notice and public hearing, the commission must either approve of the schedule so filed or establish a schedule similarly designed, in place of it; but if during any period of sixty days, more than one company files its acceptance of the act and a schedule of proposed rates of fare, the commission is not required to approve or establish the grades of fare for any such company until thirty days after the Board shall have passed upon all such schedules, previously filed in accordance with this section. Whenever by reason of any change in the existing rate of fare, there are less than four grades above or below the rate of fare in force, the company must file with the board a schedule of added grades of fare, so that there will always be both above and below the existing rate of fare not less than four grades, and the commission must within sixty days either approve of the schedule so filed or itself establish a substitute for the necessary additional grades of fare.

If at any time it is in the interest of either the public or the company that the schedule shall be changed, either with regard to the method or the basis upon which fares and transfers are established, or because the steps between the different grades are too small or too great, or for any other reason, the company, with the approval of the commission, may change the schedule. Except as thus provided, the commission is given power to modify such a schedule only after it has been in effect for a period of one year, provided, however, that no modification of the schedule which diminishes the rate of return on the stock investment may be continued for more than four months.

If on March 31 or any other corresponding quarter termination, the amount of the reserve fund is less than 70 per cent of the normal reserve fund, and during the preceding twelve months the income has been less than the cost of the service, the company is required, within thirty days, to put into effect the next higher grade of fare, and the fare is required to be decreased or increased if the amount is greater or less than these limits as of such quarterly dates. The company, with the consent of the commission, may put into effect the next higher or lower grade of fare at any time when the reserve fund is less or greater than the normal amount.

The company is required to provide an improvement fund of an amount required by the commission but not exceeding 5 per cent of the capital investment. This fund may be raised by the issue of securities. It must be fully subscribed within sixty days after the determination of the capital investment of the company and is to be paid in from time to time as required by a plan of gradual improvement to be submitted to and approved by the commission. Any company accepting this act becomes bound, by its acceptance, to sell its entire property and franchise as a going concern to the State or any municipality therein, for an amount equal to the stock investment, plus the preferred stock, the purchaser assuming the bonds, contracts, leases, and all other outstanding liabilities of the company. The provisions of the act do not affect the right of the State or municipality to acquire, by right of eminent domain, the property and franchises of any company accepting the act.

The governor, with the consent of the council, is required to appoint for a term of three years, three persons to be members of the board of directors of any company which accepts the act, of whom at least two shall be residents of a municipality served by the company, and none shall be an owner of its securities. Meetings of the directors must take place at least monthly, and in case such a board has an executive committee or finance committee, at least one member is to be one of the governor's appointees.

The commission must be furnished, monthly, with such statements as are required, including the condition of the reserve fund, the income and expenses of the present month, etc. The State is to be divided by the commission into street railway districts, and for each district within which one or more companies has accepted the act, the commission is to appoint one or more resident supervisors for terms of three years, their salaries and expense allowances to be fixed by the commission and paid by the company as an operating expense; or, if their duties extend to more than one company, apportioned among the several companies, as the commission may determine. It is to be the duty of the supervisors to keep in constant touch with the operation of the companies and to inform the commission of all complaints of the service. In case any special investigation is deemed necessary by the commission, it may order such an investigation at the company's expense. The commission may require such changes in the management or operation of any company which accepts the act as, in its opinion, may be necessary for the efficient conduct of the business of the company in the interests of the public. Any foreign company furnishing electric light or power to any street railway operating under the act must file annually with the Gas and Electric Light Commission a schedule of all rates charged to its customers for power, when the electricity is furnished by a central plant to others than the railway company, and with such other information in such form as the Gas Commission may require. That commission is authorized to prohibit the transmission of electrical energy for either light or power, unless such information is filed as requested and the prices charged therefor are determined to be fair and reasonable by the Public Service Commission.

A majority stock vote is required for the acceptance of the act by any company. The Public Service Commission may permit any company to begin to operate under the act if it has met all other requirements except as to the determination of its capital investment, but no dividends on any common stock are to be declared until the commission has determined the capital investment. The commission may order the company to dispose of any property no longer of service to the company. Any loss thus incurred may be distributed over a period of not more than ten years. During the war, and for one year thereafter, the commission may authorize any company to set aside for depreciation a smaller amount than would be adequate in normal times.

If a majority of the State directors of a company believe that the order or decision of the commission would impair the ability of the company to pay 6 per cent on the stock investment, they must seek reconsideration, with final appeal to the Supreme Court of Massachusetts, which may appoint three commissioners to consider the facts and questions at issue, and whose decision shall be final.

PUBLIC SERVICE ACT ALSO CHANGED

By another Act (Chap. 283) the Public Service Commission is hereafter to consist of three members. The terms of the commissioners are ultimately to be three years each, and any commissioner may hold hearings in the name of the full board. The present board goes out of office July 1 and the Governor is required to appoint three members, two of which are to be members of the present board, to take office at that time.

Arkansas Utilities Hold Meeting and Adopt New Association Name

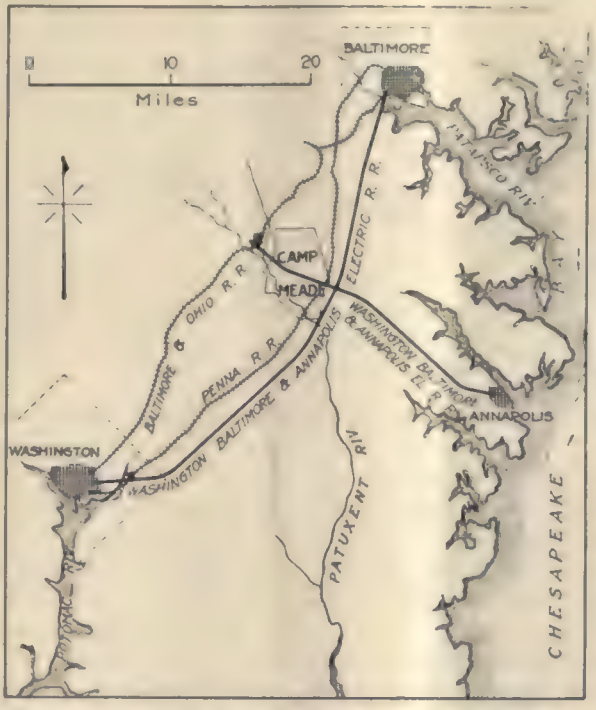
PATRIOTISM was the underlying theme of the eleventh annual convention of the Arkansas Association of Public Utility Operators at Hot Springs, Ark., on May 21, 22 and 23. Ringing addresses were delivered by the State Food Administrator, representatives of the fuel administration and State distribution of thrift stamps and by the Mayor of Hot Springs. S. E. Dillon, manager of the Hot Springs utilities, presided as president of the association. Among the technical papers considered those which attracted the most interest related to rate increases. The probability of Arkansas having a public utilities commission was also discussed. D. C. Green, vice-president and general manager Fort Smith Light & Traction Company, was elected president of the association for the ensuing year.

A shorter name, the Arkansas Public Utilities Association, was adopted.

How an Electric Railway Serves a Cantonment

The Washington, Baltimore & Annapolis Electric Railroad Supplied the Land Upon Which Camp Meade Is Built and Is Now Caring for a Traffic Which Often Amounts to 17,000 Passengers a Day Each Way

IN 1838 the Annapolis & Elkridge Railroad was built between Annapolis and Annapolis Junction, and was one of the first railroads constructed in the United States. It was taken over by the Annapolis, Washington & Baltimore Railroad, and a little more than a decade ago the latter railroad was purchased by the Washington, Baltimore & Annapolis Electric Railroad, which constructed the line between Baltimore and Washington and electrified and rebuilt the old line between Annapolis and Annapolis Junction. The new company sprang into immediate popularity, and in addition to the large general and business travel between three such important centers as Washington, Baltimore and Annapolis, it has always enjoyed a large business from government officials and employees connected with the great government institutions in Washington and Annapolis.



MAP SHOWING CAMP MEADE AND RAILROADS WHICH SERVE IT

Shortly after the United States entered the war, the management pointed out to the committee appointed to select camp sites for the training of the proposed National Army the desirability of a site on its line at Admiral for one of the proposed camps, at the same time furnishing the committee with full descriptions of the physical qualities of the land, facilities for water and other properties of the tract in which the committee was interested. The committee evincing interest in the site, the management of the railroad secured leases from the owners of the property and upon its acceptance by the government, the railroad sublet the entire tract to the United States government.

At that time there was only a single-track line between Annapolis Junction and Naval Academy Junction, the line passing through the camp site, and that was laid with 56-lb. rail. The first thing to do was to provide freight facilities by which the materials required for the construction of the camp could be taken to the site. The Pennsylvania and Baltimore & Ohio Railroads also needed access to the camp for freight, and the easiest way by which it could be supplied was by the use from Annapolis Junction and Naval Academy Junction of the electric road's right-of-way. An accompanying diagram shows the trackage and terminal system of the W., B. & A., the Pennsylvania and the B. & O. in Camp Meade.

Active construction at Camp Meade was not begun until July 1, 1917, and by Sept. 2, 8500 carloads of material had been hauled into camp, besides the material required to change the original single-track 66-lb. rail along the Washington, Baltimore & Annapolis Railway to a double track laid with 85-lb. rails and to build a double-track line for the Pennsylvania and one for the Baltimore & Ohio Railroad with the sidings shown on the map. The Baltimore & Ohio line from Annapolis Junction to the camp was begun about July 20 and completed Sept. 15.

During this time, of course, a large number of men were required in the construction of the camp. Some of them lived at the camp, but from 2500 to 3000 men preferred to commute daily on the electric line. About 70 per cent of these lived in Baltimore, 20 per cent in Washington and 10 per cent in Annapolis. On Sept. 19, the electric line hauled into camp 25,000 troops, and this number has been growing until now the camp houses about 41,000 men. The government is now planning to increase the camp in size about 50 per cent.

TRAVEL TO AND FROM CAMP IS CONSTANT

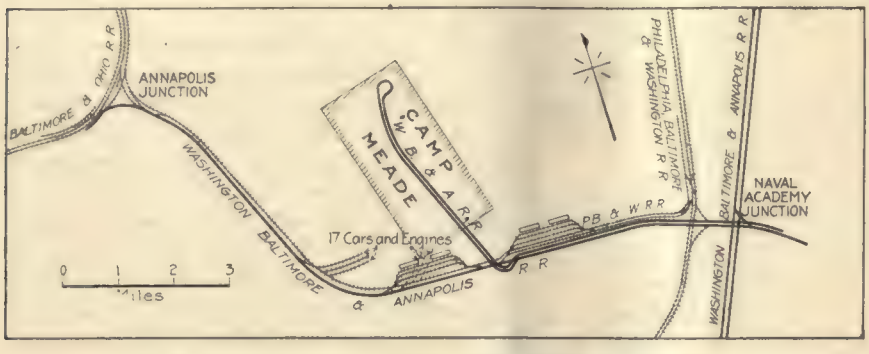
At present the company is hauling to and from Camp Meade daily about 700 laborers, besides a large number of visitors. The peak of this load comes on Saturdays and Sundays when it has been the practice to admit visitors to the camp and also to give about half of the men in training twelve or twenty-four hours' leave. The travel into the camp amounts to about 17,000 persons on these days from Baltimore, and some 6000 from Washington and Annapolis. This is in addition to the travel of the soldiers themselves, which is of course in the other direction, and is about the same magnitude. The accompanying table gives the mileage and fares charged between Baltimore, Washington and Camp Meade, the fares in Washington including a transfer to the local system of the Washington Railway & Electric Company.

To haul this traffic the company soon found that its

	Distance in Miles	One-Way Fare	Round Trip Fare
Baltimore—Washington	40 54	$0 85	$1 50
Baltimore—Camp Meade	16 56	45	[illegible]
Washington—Camp Meade	25 98	50	90

former single-car schedule was inadequate. Consequently it purchased last year eight modern high-speed electric locomotives built by the Westinghouse Electric & Manufacturing Company and fifty-four modernly equipped trail cars.

This enables the company to run during the week an hourly schedule to the camp of trains with four or five cars. On Saturdays and Sundays this headway is cut in half.



ELECTRIC RAILWAY LOOP AND OTHER RAILROAD CONNECTIONS AT CAMP MEADE

To care for the frequent traffic the company has equipped its entire line from Baltimore to Camp Meade with block signals, supplied by the Union Switch & Signal Company, and has installed a $10,000 interlocking system, built by the General Railway Signal Company, at Naval Academy Junction.

The company has also constructed two large and commodious stations. The principal one, known as Loop Station, is located half-way between this civic center and Admiral, Md.

The belief that the government will continue the occupation of Camp Meade after the war has led to other extensive building plans. One of these is at its repair shops, where the company has constructed an addition of brick and concrete, covering 241 ft. x 46 ft., at a cost of $45,000. Another important improvement under way is an extensive freight and passenger station in Baltimore. This building will occupy the greater part of the block bounded by Lombard, Eutaw, Pratt and Howard Streets and will have a floor area of 15,600 sq.ft. and a passenger track capacity of twenty-three cars.



CADETS AT ANNAPOLIS BOARDING SIX-CAR ELECTRIC TRAIN

The Washington, Baltimore & Annapolis Electric Railroad not only supplies all the passenger transportation but it also furnishes all of the electric energy for lighting and power purposes at Camp Meade. This demand, with the fact that Congress last year authorized additions to the Naval Academy building at Annapolis to cost $3,500,000 and to provide for an increase in attendance at the Academy of 1000 naval students, with a contract which the company has received to furnish electric energy necessary to operate a large radio station which the United States is planning to erect near Annapolis, has induced the company greatly to extend its power equipment. The primary power for the operation of its cars, outside the city of Baltimore, is purchased from the Potomac Electric Power Company of Washington, but the transmission and substation equipment is owned by the railway company.

During the last year the company has enlarged its substation at Scott Street, Baltimore, by the addition of two 500-kw. rotaries, its Naval Academy Junction substation by the addition of one 750-kw. rotary, and Bennings substation by the addition of three 800-kw. transformers.

Watch Inspection by Pacific Electric

Records indicate that more than 2000 watches were inspected on the Pacific Electric Railway, Los Angeles, Cal., in 1917, all of which had to be maintained at standard. At least once every quarter, every employee in train service submits his watch to one of the twenty-six authorized inspectors who subjects it to a critical examination as to its mechanical condition which must be such as to insure a close rating and not to vary in excess of thirty seconds in one week. Twice a month he must have it compared with a standard clock by an authorized inspector and every fifteen months it must be cleaned and oiled.

As tangible evidence of the fact that the employee's watch has passed inspection and conforms to the company requirements, Webb C. Ball, general time inspector, has worked out a plan whereby the employee carries a card certificate on which, besides the facts concerning the make, grade, number of jewels, etc., are also entered the dates of every comparison with standard regulator; without these credentials an employee cannot continue in service.

The Twin City Rapid Transit Company, Minneapolis, Minn., last spring agreed to plow every available foot of ground on its lines, between St. Paul and Stillwater, St. Paul and White Bear and St. Paul and Mahtomedi, turning the ground over to the men operating the cars. In addition the company will haul the crops to the city for the gardeners.

Three Cents a Mile for Interurbans

War Board Urges Filing of New Tariffs to Raise Rates to Steam Railroad Figure or at Least Maintain Former Parity—Federal Railroad Administration Favors Immediate Action and Will Support Companies

WITHIN a short time electric interurban railways in the United States will probably increase their passenger and freight rates to correspond with the rates ordered by Director-General McAdoo for steam railroads. This means a raise of passenger rates to 3 cents a mile and an increase of 25 per cent in freight rates, or at least such an increase as will maintain the previous differential between electric and steam rates.

The national scope of the movement can be judged from the facts that the Electric Railway War Board is urging interurbans to file applications for the higher rates and that the United States Railroad Administration desires the electric lines to secure new rates effective simultaneously with the steam railroad increases and will support efforts to this end. City electric railways will not be affected, but it is expected that most interurbans will file new tariffs at the earliest possible date. Several companies have already arranged to do so. The War Board feels that local authorities should respond without delay where relief is needed.

Rate Problem Has Been Hard for Interurbans

The earnings of the interurban electric railways in the United States are derived chiefly from passenger traffic, generally more than 80 per cent and often more than 90 per cent coming from this source. As is well known, however, the passenger rates on the high-speed interurban lines as a rule are the same as those of the steam railroads, which in many states are restricted by law to 2 cents a mile. What this has meant to interurbans can be judged from the following survey of the recently existing situation.

Since in Ohio and Indiana the 2-cent fare laws did not apply to the interurban lines, the Public Service Commissions, recognizing the urgent need of immediate relief, recently permitted certain interurban companies to increase their fares to 2½ cents a mile. The results of this action, however, were disappointing because the steam lines competing between the same points offered the statutory and smaller fare of 2 cents a mile. As a result a material part of the interurban traffic, which is almost entirely intrastate in character, went to the steam lines. It was evident, therefore, that the interurban companies could not secure the necessary additions to their revenues through higher fares unless the fares of the steam railroads were increased at the same time.

The statutory rate of 2 cents per mile in various states had been fixed at a time when operating costs were far less than now. It was manifest that if such rates were justified when made, they were insufficient now. Indeed, the Interstate Commerce Commission recognized this fact, and it approved as fair and reasonable a steam railroad rate for interstate traffic of 2½ cents a mile.

But an anomalous situation was thereby created. The fares paid by two passengers riding in the same seat on the same steam railroad train might be 2 cents per mile for one and 2½ cents per mile for the other, depending on whether the passenger was making an intrastate or an interstate journey. Such a difference in rates for identical service caused constant evasion of the law, it being common practice for interstate passengers to pay their fares in instalments at intrastate rates so as to avoid the through interstate rates.

By reason of the facts stated, it had become a matter of vital consequence to the interurban companies that the intrastate steam railroad rates be raised to the level of the interstate rates. With that done, the interurban companies would have a chance to meet the emergency confronting them. Otherwise they would have none.

Real Emergency Confronts Interurbans

As to the reality of the emergency confronting the interurban electric railways of the country, there can be no doubt. Their expenses have increased in recent years to a greater extent than their gross revenues. The margin of safety was extremely small in almost every case even before the United States entered the war, and since that time it has rapidly approached or passed the danger point.

With the view, however, of ascertaining the exact situation of the interurbans, the War Board recently sent out to a large and representative list a blank for a five-year income statement and also the first quarters

COMPARATIVE INCOME STATEMENT OF 127 INTERURBAN ELECTRIC RAILWAYS

Items	1917	1913	Increase
Passenger revenue	$183,925,488	$152,923,648	$31,001,840
Express revenue	1,911,044	1,644,071	266,973
Milk revenue	587,252	514,920	72,332
Freight revenue	12,715,270	7,386,879	5,328,391
Other transportation revenue	1,682,726	1,672,673	10,053
Total revenue from transportation	$200,821,780	$164,142,191	$36,679,589
Revenue from other railway operations	6,925,543	5,229,628	1,695,915
Railway operating revenues	$207,747,323	$169,371,819	$38,375,504
Way and structures	$20,376,854	$15,423,315	$4,953,539
Equipment	16,901,711	11,976,814	4,924,897
Power	29,598,661	57,881,906	27,681,698
Conducting transportation	55,694,943		
Traffic	963,376	970,496	*7,120
General and miscellaneous	20,616,173	15,433,900	5,182,273
Transportation for investment	124,073	124,037	
Railway operating expenses	$144,297,645	$101,686,431	$42,611,214
Net revenue from railway operations	$ 63,449,678	$ 67,685,388	* $4,235,710
Auxiliary operations—revenues	$ 15,589,699		
Auxiliary operations—expenses	8,849,333		
Net revenue from auxiliary operations	$ 6,740,366		$ 6,740,366
Taxes assignable to railway operations	$ 13,417,547	$ 10,343,626	$ 3,073,921
Operating income	$ 56,742,497	$ 57,341,762	*$ 599,265
Non-operating income	10,082,693	8,969,002	1,113,691
Gross income	$ 66,825,190	$ 66,210,764	$ 514,426
Deductions from gross income	57,009,010	45,082,768	11,926,252
Income balance	$ 9,816,180	$ 21,228,006	*$11,411,826

*Decrease

of 1917 and 1918, and a blank for fuel costs, traffic statistics and financial data. Part of the collated data resulting from this research are reproduced herewith.

The statement on page 1099 for 127 interurbans, for example, shows that between 1913 and 1917 the passenger revenue gained $31,001,840, but the railway operating expenses increased $42,611,214. Taxes rose $3,073,921, and income deductions $11,926,252, with the result that the net income fell from $21,228,006 in 1913 to $9,816,100 in 1917, a loss of $11,411,826.

An examination of the returns of twelve important companies for the years 1913 and 1917 and for the first three months of 1917 and 1918 showed even more startling results. The net income was $4,111,000 in the year ended June 30, 1913, and only $656,000 in the year 1917, notwithstanding the fact that the railway operating revenues in 1917 were $4,000,000 greater than in 1913.

In the three months ended March 31, 1917, the net income was $318,000, but in the three months ended March 31, 1918, the charges exceeded the available income by $533,000. In other words, the income statement for the first quarter was more than $850,000 worse in 1918 than in 1917. Even if the operating results for the last nine months of 1918 are no worse than those of the last nine months of 1917, the twelve roads will show a deficit of $215,244 on the year's operation, as compared with a net income of $656,699 in 1917.

Railroad Administration Desires Higher Interurban Rates

When Director-General McAdoo on May 25 promulgated General Order No. 27, increasing the wages of steam railroad employees, and General Order No. 28, fixing higher passenger rates, effective on June 10, and higher freight rates, effective on June 25, the War Board forwarded copies of these to the interurban lines, together with orders of the Interstate Commerce Commission authorizing new joint rates between administration carriers and others not under federal control.

The War Board also sent a letter explaining its opinion regarding interurban increases. The most striking part of the communication was at the beginning, where the board directed the attention of electric carriers to the following facts:

> The United States Railroad Administration desires that electric railways take immediate steps to bring their rates to a parity with the new government rates and to make their new rates effective simultaneously therewith, and it will support your effort with the state public utility commissions to make this possible.

The War Board then went on say that it had discussed these questions with a number of men prominent in the industry and, as a result of the statistics which it had been gathering, was fully advised as to the straitened conditions in which most of the electric lines find themselves at this time. It remarked that General Order No. 27, increasing the wages of steam railroad employees, had completely unsettled the labor conditions on electric lines and would result in further shrinkage in their net income.

No Cut-Throat Competition Should Be Started

Continuing, the War Board said:

> Increased revenues and financial relief must be provided immediately if the industry is to survive. By adopting the new government rates, electric railways will not only insure an immediate increase in their revenues but by competing with the government-controlled roads on an equal footing they must win such recognition from the Railroad Administration as will result in co-operation, instead of competition, to the mutual advantage of both classes of roads.
>
> To attempt to attract business from steam railroads controlled by the government by maintaining lower rates and in turn seeking relief from the government, both financial and otherwise, is not consistent, and we believe unwise. Each will then have alloted to it that class of business which it is suited to serve with the greatest advantage to the community and to itself, and neither will be required to render any service without adequate compensation.
>
> There is more than enough business for all, and when once a proper understanding and relationship have been established between steam and electric roads, there will no longer be an excuse or an incentive for a road to take on, at a loss, a class of business for the handling of which it is not suited merely to keep it away from another road which is equipped to handle it with profit.
>
> The whole-hearted co-operation of electric lines with the steam roads will give the government a new and broader conception of the functions and value of the former, not only as an indispensable element in the daily life and convenience of the communities which they serve but also as an invaluable aid to the nation in its herculean efforts to meet the present war crisis. When the government has come to a true realization of their real value, the financial needs of electric railways should be provided for as promptly and as fully as the steam road requirements are now being cared for.
>
> For all of these reasons, you are strongly urged to file an application with the proper state and federal authorities for the right to increase your rates, both passenger and freight, to bring them up to the new steam railroad rates or at least by such amount as will retain the present parity between your rates and the steam railroad rates.
>
> The local and state authorities should respond without delay in cases where relief is needed because of changed conditions, as it is clear that the soundness and efficiency of electric railways is intimately connected with a vigorous and successful prosecution of the war.

Compilation of New Rates Under Way

With the foregoing letter E. C. Faber, manager of the War Board, also enclosed a draft of a petition adaptable for presentation to any commission. The leading clause of this reads:

> In addition to authority already in hand for increasing joint fares applying from points on the line of your petitioner to destinations on the lines of Administration carriers, it is desired also to advance fares between points on the lines of your petitioner proportionate to those established for the carriers under the control of the Administration, namely, to a minimum rate of —— cents per mile. Unless this permission is accorded, the fares of the Administration carriers between points competitive with your petitioner will be prejudicially effected by reason of the fares of your petitioner being constructed on a much lower relative basis, the rate per mile for the schedule of charges now effective being——.

The War Board is now sending out to interurbans a data sheet showing the steam railroad passenger rates now in effect between points on the interurban line and the new rates effective on June 10, and also the present interurban rates between the same points. Another column is provided for new interurban rates, from which data will be collated in regard to the movement for higher interurban rates throughout the country.

Interurban electric railways in Ohio, Indiana, Kentucky and Illinois have taken steps to apply for increases in both the passenger and the freight rates. The company in general feel that the passenger rate should be 3 cents a mile and that an addition of 25 per cent should be made to the freight tariffs. On some of the electric lines passenger rates do not average 2 cents a mile, and in no case does the average reach 2½ cents a mile, although some have been allowed to increase their rates since the war began.

Cutting Loose Insulation from Overhead Lines

An Inexpensive Tool Used With Good Results as an Aerial Insulation Cutter by the Denver Tramway Company

BY O. P. MORSE
Superintendent of Overhead and Bonding

AFTER experiencing considerable trouble on our 13,000-volt high-tension line during wet weather we made some tests and found that loose insulation was responsible for the trouble. At points where loose ends of insulation lay across one or more wires, a small amount of moisture on the insulation carries enough current to cause a short-circuit. Investigation showed that



INSULATION CUTTER IN OPERATION ON THE OVERHEAD LINES OF THE DENVER TRAMWAY

practically one-third of our 27 miles of line had loose insulation of this character, although this wire had been in service only ten years.

As this wire was all installed on 50-ft. poles or higher, the removal of this loose insulation became somewhat of a problem. Otherwise it would have been necessary to renew the wire, a very expensive procedure at this time.

After several unsuccessful efforts to remove the loose ends by burning with a blow torch which was made to travel underneath the wires we made up the small tool shown in the accompanying illustration. This has proved very satisfactory.

The insulation cutters consist of two old hacksaw blades each 1 in. wide by 3 in. long, sharpened and fastened to a wooden block. These blades were made to form a V with the outer ends ¾ in. apart. The block to which they are fastened has a rounded groove for guiding the insulation into the cutter. Two wooden wheels serve to support this and provide the means for running it along the wire. This is done by linemen on each pole pulling it in either direction by means of ropes fastened to the end of the tool. At some points loose insulation was found which kept very close to the wire, being loose at the center and supported at the ends. To cut this insulation loose the cutter was provided with a vertical arm 3½ ft. long. A rope was attached to the bottom of this arm and, by pulling, the tool was tipped slightly so as to raise the cutter up against the wire and cut the insulation loose.

In regular operation it was found that six wires could be cleaned off between poles in twenty minutes, and a crew of two linemen and a foreman were able to clean up all our lines in twelve days. We now intend to have the line overhauled once about every three months. This work should not take more than one or two days.

The cost of this tool was only $5 and it will last indefinitely.

Winking Highway Signal Protects Dangerous Crossing on Union Traction Company's Tracks

THE Union Traction Company of Indiana has recently made a trial installation of a flashing highway danger signal. This is located just outside the city of Indianapolis at the point where Orchard Avenue crosses the Anderson line. This crossing is particularly dangerous to highway traffic due to the presence of a fork in the roads at that point, making it impossible for automobilists or other drivers to see ahead for any great distance. The very considerable travel on this highway makes it necessary to have an effective signal at this point.

Accompanying illustrations show the layout of roads and tracks at this point and a view of the signal as installed. The flashing signal used is made by the A G A Railway Light & Signal Company, Elizabeth, N. J. In this signal the light is produced from acetylene and the operating mechanism automatically governs the flow of gas in such a way as to make it intermittent. A small pilot light burning continuously ignites this efflux of gas and produces the flash or winking effect. This arrangement is economical of gas. The distinctive characteristic of this light is that it suddenly bursts out and is as suddenly eclipsed. The automatic extinguishing and relighting of the main flame insures attention that would not be possible with a steady burning light or one that grows and fades. The light flashes



LOCATION OF SIGNAL AT ORCHARD AVENUE CROSSING NEAR INDIANAPOLIS, IND., AND VIEW OF SIGNAL INSTALLED ON LINE OF THE UNION TRACTION COMPANY OF INDIANA

through a red lens in the center of the lamp and at the same time illuminates the lettering on the lamp box as shown in the illustration.

The signal as installed is supported by a wrought-iron pipe mast through which the gas pipe is conducted to the burner. The gas container is a 12-in. x 36-in. tank mounted at the base of the structure. It has capacity for sufficient acetylene gas to operate the signal for 300 days without recharging. While the signal as installed

on the lines of the Union Traction Company flashes constantly, it can be connected with the track circuit so that the danger signal will be given only as a train approaches the crossing.

Skidding Test on Cast-Steel Wheels

BY HOWARD W. QUINN
Acting Superintendent of Car Repairs, Bay State Railway, Boston, Mass.

SOMETIME ago the writer conducted a skidding test on Davis (American Steel Foundries) one-wear, cast-steel, manganese-tread wheels. It was desired to determine to what extent a skid of very unusual length would flatten these wheels and to that end a stretch of level, tangent track 110 ft. in length was prepared for the test and was divided into three parts parts, as indicated in the accompanying sketch.

The first section, 30 ft. in length, had both rails greased with heavy oil; the next 30 ft. section had both rails greased and sanded, and the remaining 50 ft. section had both rails covered with dry sand. The test was made with a 30-ton, double-truck Brill "Easy Access" car with 33-in. wheels and consisted in starting the car and attaining an approximate speed of 35 m.p.h. at the moment of entering upon the 30-ft. greased section of track. An emergency application of the

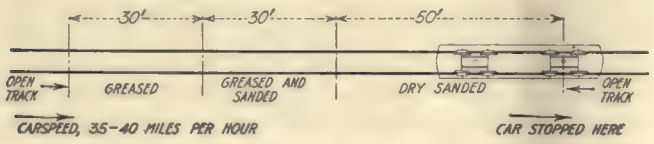


DIAGRAM OF TRACK USED IN WHEEL-SKIDDING TEST ON BAY STATE STREET RAILWAY

air brakes readily locked all eight wheels and they were permitted to skid until the car came to rest in the position indicated in the accompanying sketch, with the forward pair of wheels just clear of the farther end of the 50 ft. dry-sanded section. It will be observed that the forward pair of wheels skidded the full 80 ft. while the rear pair skidded some 25 ft. less or 55 ft. under the most severe conditions obtainable. Careful watch was kept by observers on the street to determine whether or not the wheels revolved, and it developed that the wheels remained fixed thus constraining the entire abrasive action to the eight points of contact with the rails, which points were prick-punched for identification before moving the car. A careful, visual examination of wheel treads disclosed a brightly polished eliptical spot of about $\frac{3}{8}$-in. major axis and $\frac{1}{4}$-in. minor axis, which could not be considered objectionable or render the wheels unsuitable for additional service. That the manganese treads are somewhat ductile was evidenced by the slight flowing of the steel to the trailing side of the contact elipse where it was deposited in a very thin ridge of about $\frac{1}{64}$ in. in height. After the test was completed the test car was again put back on the line, and the wheels rendered satisfactory daily service for fifteen months at which time they were removed as worn out. An accurate record of the additional mileage made was not kept, so it is impossible to state the exact amount of this, but it was high, and no evil results were experienced from the test.

Estimated Savings in Skip Stops

Fuel Administrators Throughout the Country Are Seeking Co-operation of Public Service Commissions and Utility Companies to Conserve Fuel

IN AN article on war conservation of power and light in this week's issue of the *Electrical World*, Charles E. Stuart, chief of power and light division, United States Fuel Administration, discusses some of the economies of the skip stop which he refers to as one of the most promising methods by which economy in the use of fuel is being obtained. Continuing he says:

"With the present practice of having cars stop on signal at any street corner, there are usually from twelve to fourteen stopping points per mile. With the skip-stop system, properly applied, these are reduced to not more than eight per mile in the business districts, six per mile in residence districts and four per mile in the open country. With the number of stopping points decreased in this way, a saving of from 10 to 15 per cent can ordinarily be effected in the power and hence in the fuel required, while at the same time the average speed of the cars is increased, without any increase in the maximum speed, and the service thus improved. Since this measure secures economy in fuel not only without handicapping the service, but with an actual improvement, it is obviously an extremely desirable type of conservation measure.

"Our plan is to secure the adoption of the system by voluntary co-operation between the railway companies and the various municipal authorities or state commissions and to bring about this co-operation through the federal fuel administrators for the several states. These administrators are all men of influence in their communities, and so far we have found in every case that a request from the state administrator to the proper authorities was all that was necessary to secure permission for the introduction of the system as a conservation measure during the war. With permission thus provided for, the railway companies have all been glad to adopt the plan.

"Through our efforts, through the independent efforts of various local administrators or through the efforts of certain railway companies themselves, the skip-stop system has been adopted, or is about to be adopted, as a coal conservation measure in Detroit, Washington, Baltimore, Brooklyn, Cincinnati, Columbus, Dayton, Toledo, Indianapolis, Evanston and South Bend, Ind., Newark and the other cities of New Jersey, New Haven and all the other cities of Connecticut, and in Oakland, Berkeley and Alameda, Cal.

"The Connecticut Company has reported a saving in fuel of 10 per cent for its New Haven lines, and reports indicate saving in the other places at rates varying from 3600 tons per year in Columbus to 21,000 tons per year in Detroit.

"Various schemes for reducing car heating have been contemplated, but as yet no definite plans have been formulated."

The Fuel Administration is also devoting attention to the saving of power through the elimination of uneconomical isolated plants, better utilization of power and light in factories, development of water power and interconnection of power systems.

LETTERS TO THE EDITORS

Economy of Checking Devices for Motormen

ECONOMY ELECTRIC DEVICES CMPANY

CHICAGO, ILL., June 4, 1918.

To the Editors:

I have read the leading editorial in the June 1 issue with great interest, because it is a straight-from-the-shoulder statement of the situation. You make the point very forcibly that power is being wasted, and every manager of the numerous roads using energy-checking devices has, in substance, voiced your editorial. It is safe to say that almost without exception every such road will testify that irrespective of schedule refinements, the checking of the motormen through the use of a checking instrument will bring about at once substantial savings and will hold these savings.

As a rule it is not good form for the manufacturer to criticise his possible customers, but I have found the electric railways ready to admit just what is stated in your article and conclude their admissions with some qualifying statement, as, for example: "We know we could reduce our energy consumption 10 per cent, but the labor situation is so delicate at this time that checking devices could not be introduced on our property without a disturbance."

It has been our experience that no class of motormen is willfully wasteful, but unless the men are operating under some checking system they have no knowledge of their power efficiency so long as they keep from accidents and handle their cars on time. The trolley wire is there with an unlimited supply of power, so far as the handling of the controller and brakes on any one car is concerned. It is true men are taught the correct handling of controller and brakes when they are broken into service, but without some stimulus any individual will settle down to the easiest way of doing his duties. Even if the company kept no records of the readings, a device by which the men could check their own performance would undoubtedly be so used and would prove an inspiration to better performance. Actually the acceptance of the Economy meter by the car crews as a fair measure of their performance has been thoroughly discussed in labor conferences, and the checking of men in accordance with their power consumption has been approved by both parties to the conferences.

You mention that possibly one reason for the slowness of the electric railway industry in universally adopting car-checking devices is the lack of funds, and your statement is true that this cannot be finally considered as a real reason because the instruments can (and do) earn their cost before they are fully paid for. We have several examples of properties which have installed meters at a cost of from $50 to $60 per car. The annual carrying and operating charges have been around $20 a car, and the actual power saving has been around $100 per car per year—and this at the pre-war coal prices.

It is true that the introduction of a checking device calls for a new department or a sub-department; but if that department can support itself, pay off its capital charges and show a 25 per cent profit on the investment for the first year, it certainly should be worth prompt introduction. But the railroads want to be shown and in several instances we have equipped lines or parts of lines by carrying out tests or permitted the roads to carry on their own tests, with our instruments. And in no case has this failed to convince the management that savings in substantial amounts were easily possible. Because of these conditions we have offered a leased-payment plan by which, in a period of years at a fixed rental per day, the meter would become the property of the road.

L. E. GOULD, President.

What the Rail Rate Raise Means

MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY,

MILWAUKEE, WIS., MAY 28, 1918.

To the Editors:

The $880,000,000 a year increase in railroad freight and passenger rates, ordered by Director-General McAdoo, comes in season to save several hundred thousand railroad employees from being too grossly underpaid in a time of high prices. They will get $300,000,000 a year of the $880,000,000, and most of this $300,000,000 will go to employees who for years before the war were grossly underpaid.

The rate increase comes too late to enable the railroads to increase their equipment sufficiently to meet the traffic needs of the nation at war. The other $58,000,000 a year will be used in this way, as rapidly as possible, but it will buy less than half as many cars, engines, etc., at present prices, as the same sum would have bought any time prior to 1915. The railroads have been eager to buy more cars and more engines and to increase their mileage and enlarge their terminals for years past, but they have been denied rates adequate to pay for these betterments.

The Interstate Commerce Commission and the state railroad and public service commissions are now seen to have failed of their duty in this respect. State and city attorneys, eager to "save the people" by suing to prevent badly-needed rate increases, have contributed to the failure of the Interstate and state rate commissions to provide for the maintenance and due expansion of the country's commercial public highways. State and city chambers of commerce and other business organizations, each seeking its own local or sectional advantage, have shortsightedly and in the final result disastrously thrown their influence against the granting of rates needed to enable the railroads, as a whole, to pay good wages, give ample good service, make necessary extensions of plant, and yield an assured fair return on investment.

The railroad companies cannot escape a large share of responsibility for the railroad system's progressive decline in total efficiency during the past twenty years. Their controllers while still in private management could have got what they needed, with public approval, had they merchandised their service, just as all other merchants do, by intelligently and persistently advertising its cost and value.

Operators, rate regulators, public attorneys, political shysters, honest but uninformed reformers and provincially selfish business organizations collectively brought the railroads to a point where the federal government had no alternative but to take them over and operate

them with the backing of public credit, in order to make them, so far as possible, satisfy the requirements of the nation at war.

It appears from the newspaper reports that some of the state commissions are "stunned" by this invasion of their field by the federal government. The effect of Director-General McAdoo's order is to take control of railroad rates away from the state commissions for as long as the federal government shall operate the roads. It may be added that the state commissions are likely to be "stunned" a second time, in the same way, if they do not with necessary promptness grant the rate relief essential to maintain the credit and the efficiency of the street railways, gas and electric services and other public utilities still under their control. The same factors that made the steam railroads incompetent to meet the public's requirements during peace and utterly incapable of satisfying the nation's war demands have during the same period been operating to strangle the municipal public utilities of the country.

A shortage of gas and electric energy and a crippling of electric railway facilities for vastly increased requirements of war industries is in sight. It may easily become as great a menace to the nation's war industrial efficiency as the breakdown of the steam railroads shortly before the government took them over. And it may be expected to produce the same result, if the state and city authorities which still have power to regulate utility revenues fail to grant in time the increased rates needed to keep these utilities efficient. The United States is going to win the war. It is going to make and keep the country's industrial power and its urban transport equipment competent to do its full share in winning the war. If the state and city authorities which now control these utilities fail to assure their competency, it goes without saying that when the situation becomes sufficiently acute to warrant such action, the federal government will find a way to assure it.

The hasty assumption that increased railroad and public utility rates will be a "burden on the people" is unwarranted. The people as a whole will pay these increased rates with increased wages and increased incomes. The dollar of 1915 is to-day worth only 50 cents across the counters of merchants of all kinds. The absurdity and the rank injustice of requiring investors in and employees of regulated industries to accept as their wage the same number of the 50-cent dollars of 1918 that they got of the 100-cent dollars of 1915, when everybody else is getting a doubled wage or near it, must be admitted by all who have any desire whatever to be fair to the utilities.

For the period of the war at least, radical newspaper manufacturers, radical politicians and any others who have hitherto prospered by "hammering the railroads and public utilities" will have to find new bogies or fall silent. The decree of a radical government raising railroad rates $880,000,000 a year and railroad wages $300,000,000 a year, as a plain matter of justice and national health, pretty effectively disposes of this particular bogy. Director-General McAdoo, being a first-class salesman, has explained his order in a way to make it acceptable to the public. The railroad operators could have done this years ago, had they been salesmen.

FRANK PUTNAM.

AMERICAN ASSOCIATION NEWS

"Do It With a Purpose"

This Was Mr. Brush's Message as He Awarded Charter Membership Cup to Providence Section

THE recently formed Rhode Island Company section met at Providence on June 3 to accept the custody of the company section charter membership cup presented to the association by the ELECTRIC RAILWAY JOURNAL and to listen to addresses by M. C. Brush, president Boston Elevated Railway, and W. C. Slade, superintendent of power and lines of the local company. Mr. Brush stirred his audience powerfully by his appeal for patriotic co-operation with the government in the faithful performance of transportation duties. Mr. Slade gave an illustrated lecture, in non-technical language, showing how the automatic substation is playing an important part in power distribution economy and how it is actually being applied on the Rhode Island Company's lines. In addition to the longer addresses, a message to the section from James H. McGraw was read, and Martin Schreiber, Newark, N. J., Charles C. Peirce, Boston, Mass., and H. H. Norris, New York City, spoke briefly on the week of the company sections.

Disclaiming any desire to "preach" to his audience Mr. Brush took occasion to point out a few essentials of success in railway work, particularly for the benefit of the younger members of the section. He illustrated his points with interesting personal reminiscences. Success, he said, is due largely to the friendships which one forms. These should be capitalized but not commercialized. Most of the friction which occurs in the work of any organization is due to lack of acquaintance on the part of responsible officials or their representatives. The company section affords excellent opportunity to promote friendship.

Above all, Mr. Brush said, there must be a purpose in everything that is done. If a man wants to read "Nick Carter" he is justified in doing so if he believes that he will thus accomplish some definite aim. On the other hand, it is wrong to do anything just to "pass away the time." In bringing the matter closer home he said that if those present at the meeting did nothing on the next day in a manner different from that which characterized their previous work the meeting for them would have been a failure.

Mr. McGraw's message to the section was as follows:

You have done a wise and patriotic thing in organizing this company section. It ought to be a potent factor in making the Rhode Island Company stronger and more useful to the important communities which it serves. We look to New England to furnish many of the munitions of war. In this work electric railway transportation is an essential element. My plea is that you aid your company and thus your country by giving this community even better than first-class service.

You have made a splendid start, but it is only a start. The section will not run itself. Teamwork is urgently necessary from the start. For a while the starting enthusiasm will carry you along. Then will come a period of reaction. This will be the time when you must all put your shoulders to the wheel. After this the company section will be an integral part of your whole organization and it will function naturally and with less effort. Wise planning is necessary now, and especially in tiding you over your first summer. With your enormous charter membership you ought to accomplish great things from the very start.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Finances, Wages, Fares

All Three Enter as Considerations Affecting the Immediate Future of the International Railway

An investigation will be made into the financial affairs of the International Railway, Buffalo, N. Y., by the City Council to determine whether or not the company should be granted permission to increase its rate of fare within the city from 5 cents to 6 cents. The City Council asked the Public Service Commission for the Second District to make the inquiry but the commission has refused to take any official action in the matter, apparently holding that owing to franchise restrictions the fare question is one to be settled between the city and the railway.

Urgent pleas are being made to the Council by Edward G. Connette, president of the railway; Thomas Penney, vice-president and general counsel; E. J. Dickson, vice-president, and Henry W. Killeen, of Penney, Killeen & Nye, of counsel for the company, for immediate action because the employees of the company are threatening to strike unless their pay is raised immediately.

Six-Cent Fare Essential

President Connette has told representatives of the motormen, conductors and shopmen that he is willing to grant a substantial wage increase, but owing to the financial condition of the company, an advance in wages cannot be granted until after the 6-cent fare application of the company has been approved by the municipal authorities. The company in a signed statement to the City Council sets forth that the entire revenue obtained from the additional 1 cent collected from passengers will be used in giving employees a substantial wage increase and for improvements and additions to the company's tracks, rolling stock and other equipment. President Connette also promised that none of this additional revenue will be used for paying dividends. It is estimated that the additional 1 cent collected from passengers will increase the company's revenue approximately $1,200,000 a year.

After a series of conferences and public hearings the Council made a report to the public which said that "the transportation service supplied by the International Railway is now and has been inadequate for several years and has been at times intolerable. Reports filed with the New York State Public Service Commission show that the company derives large revenues from the operation of its lines in Buffalo and that these revenues are quite sufficient to enable the company to pay fair and reasonable wages to its employees. The wage paid to the employees by the company is solely a matter between the company and its employees and the company is in error in seeking to involve the Council in any wage controversy."

An opinion to the City Council by the Corporation Counsel says that the Council has no power to make an agreement with the company providing for an increase in the prevailing rate of fare without authority from the New York State Legislature. He holds that the Milburn agreement between the city and the International Railway providing for a 5-cent fare with free tranfers cannot be terminated without legislative authority.

In answering this opinion of the Corporation Counsel, Henry W. Killeen, of counsel for the company, says that it is imperative that the 6-cent fare be granted as an emergency measure by the Council. The International Railway can then have the city's decision ratified by the Legislature.

Finds Franchise Burdens Onerous

The application of the Puget Sound Traction, Light & Power Company to the City Council of Seattle, Wash., for relief from its franchise obligations during the period of the war, and a reasonable length of time thereafter, has been referred to a committee consisting of Councilmen Erickson and Lane, and Thomas F. Murphine, superintendent of public utilities. The action was taken after A. W. Leonard, president of the company, appeared before the joint committee on franchise and judiciary, explaining the necessity of some action being taken to enable the company to improve its service. Mayor Hanson met with the committee and asked Mr. Leonard numerous questions dealing with the holdings and earnings of the company. Mayor Hanson also asked Mr. Leonard if the franchise obligations were suspended by the city, would better service be furnished by the company. To this Mr. Leonard said he would not want to make any definite promises unless he knew that he could back them up.

Councilman Thomson stated that he would write Mr. Leonard within a week, giving his ideas regarding the proposition of the city taking over the company's lines.

The day previous to the hearing before the joint committee on franchises and judiciary, Mayor Hanson addressed a communication to Mr. Leonard, making formal demand that the company comply with its franchise provisions "without further delay or equivocation."

Chicago Essentials Fixed

Officers of Surface and Elevated Lines to Report Back Soon on Acceptability of Terms of New Grants

New ordinance developments progressed another step in Chicago, Ill., during the two weeks ended June 1, when the tentative draft of the franchise was corrected and approved by the sub-committee of the City Council. The essential features have now been determined and representatives of the surface and elevated roads agreed to report back within a short time as to their acceptability.

Renewals a Problem

There was considerable discussion of the renewals question, the attorney for the committee contending that property should be maintained at 100 per cent, while the companies argued that it should be kept up to a standard of good operating condition. Mr. Busby referred to the Surface Lines renewal fund, which now aggregates $8,500,000, and is growing at the rate of $1,500,000 each year. It was finally agreed that the requirement for renewals be fixed at 8 per cent, and if more money is needed for actual renewals this should be provided by the company if so ordered by the local commission. There was considerable debate over the protection for the 1 per cent of gross earnings, which is to be allowed the company if earned over and above the 6 per cent guaranteed return on capital account. The sub-committee finally decided that the 1 per cent would be cumulative if an excess were earned in any succeeding year. It was also decided that capital investment would be limited so as to give protection to this 1 per cent allowance.

Amortization Considered

There was considerable discussion of an amortization fund and both sides agreed the minimum should not be set too high, as this would mean that the present generation would pay for the property and that the succeeding generation get all the benefits of cheaper service. The question of service in and out of the city, about which there has been much dispute, will not be settled until the bills are drafted for the Legislature next fall. The matter of financing the new corporation was also discussed at length.

The local newspapers are favoring speed in the settlement of long pending traction controversies and have urged the committee not to quibble over small points, because if the matter is not settled by the City Council this summer, it must go over for at least two years.

Boston Plan Approved

Stockholders Vote for Public Operation and Authorize New Issue of Preferred Stock

The stockholders of the Boston (Mass.) Elevated Railway on June 3 voted to accept the act of the Legislature providing for public operation and to issue $3,000,000 of 7 per cent State-guaranteed stock to carry out the purposes of the law.

At the meeting M. C. Brush, president of the company, said that the flotation of the stock issue was absolutely necessary if the act was to become effective and that the notices would be sent out immediately requesting subscriptions. Mr. Brush was quoted as follows:

"In my opinion, this legislation is the most constructive ever enacted in the United States for a public service. The electric railways of this country are, generally, in very bad financial condition. Under this plan the stockholders are assured that obsolescence of the road and equipment will be taken care of, that the affairs will be well managed and the service kept up to reasonable requirements, at least, and that the State will pay your dividends if the road doesn't."

He then reviewed the difficulties of securing the passage of the bill, saying that he had devoted a large part of his energies to it for two years and that the directors also had worked untiringly. About 150 men, as he estimated it, had devoted a considerable part of their time to the study of the electric railway problem and finally had worked out what was believed to be a sound and workable plan. Mr. Brush gave it as his opinion that once the plan is found to work as well as is expected, it will never be given up by the State. Under no conditions can it be thrown over before the end of ten years, and then only by serving two years' advance notice.

The terms under which the road will be operated have been reviewed previously at length in the ELECTRIC RAILWAY JOURNAL.

Atlantic City Strike Settled

The strike of the motormen and conductors in the employ of the Atlantic City & Shore Railroad, Atlantic City, N. J., has been settled. The men have been restored to their positions and are receiving an increase in wage. The settlement was brought about at a conference between Clarence L. Cole, receiver for the company, and representatives of the Amalgamated Association. It was agreed to settle future deadlocks by arbitration. The men agree to work ten hours a day and are to be treated by the company as individuals and not as a unit of the union. The union is to conduct its affairs as it will, and the company reserves the same right.

Previous to the strike the employees were receiving 25 cents an hour the first year on the Atlantic City line; 27 cents the second year and 29 cents for three years or longer. Those on the Ocean City line were being paid 27, 29 and 31 cents. The former will now receive 31, 33 and 35 cents an hour while those on the Ocean City division will be paid 33, 35 and 37 cents an hour. All shop employees and those engaged in various other lines of work benefit by the 6-cent advance.

The strikers demanded that six men be discharged who remained at their posts when the strike was declared, but finally consented to have them remain because they were old hands. The company will now have to pay out annually to the men in its employ $14,000 more in wages.

Franchise Negotiations Fail

The City Council of Norfolk, Va., has voted against the combination of the electric lighting and power and traction franchises, in the new franchise proposed by the Virginia Railway & Power Company. This will probably put an end to all negotiations looking to a rerouting plan for Norfolk under a new franchise. W. H. Venable, counsel for the company, stated during the discussion of the proposition that his company could not consider a franchise which would not include light and power as well as traction. Later on Mr. Venable stated the company would take no further steps. He declared that it was impossible to look upon the two branches of the company's business as other than a whole because bonds had been issued covering all the activities of the company and the trustees representing the holders of the bonds would not consent to a separation of the businesses.

Wage Advance in Philadelphia

The management of the Philadelphia (Pa.) Rapid Transit Company on May 28 expressed its appreciation of the loyalty of its employees who stood firmly against the attempt of outside influence to disrupt the service, and in anticipation of the increased fare for which it has made application, announced that it had decided to advance the wages of all employees, paid on an hourly basis, 2 cents an hour. The wages of men, paid on a monthly basis and receiving less than $200 a month, will be correspondingly advanced.

The advance will be made effective as of May 16, 1918. The company will endeavor to secure the increased fare at the earliest possible date and upon receiving the same will at once make the further increase of 3 cents an hour in keeping with its original promise.

On May 29 two weeks had elapsed since the attempted walk out, to which reference was made in the ELECTRIC RAILWAY JOURNAL of May 25, page 1023. In fairness to the men who have operated the cars, May 29 at 8 p m. was fixed as the limit of time during which the few men who at that time were still out could return to duty without the loss of their seniority rights.

St. Louis Wages Adjusted

Men Get Advance of Ten Cents an Hour, With Guaranteed Minimum of $70 for Extras

The agreement reached between the officials of the United Railways, St. Louis, Mo., and a committee representing the local union of the Amalgamated Association of Street & Electric Railway Employees of America has been ratified by the men in the employ of the company by vote. The agreement contains forty-eight sections.

AGREEMENT FOR THREE YEARS

The company will increase the pay 10 cents an hour. This is equivalent to a flat increase of 35 per cent. The agreement is to continue in force for three years from June 1, 1918, but the rates of wages and the hours may be readjusted on June 1 of each year the agreement is in force if either the company or the association demands a rearrangement on or before April 1 of such year. If the company and the association are unable to agree within thirty days upon the hours and rates of wages to be paid for the ensuing year the matter is to be submitted to arbitration. All extra men are to be guaranteed $70 a month provided they report three times every day. For each miss or other absence from duty in a thirty-day month, one-thirtieth of $70 is to be deducted.

The wages of motormen and conductors in the employ of the company effective June 1 will be as follows:

DETAIL OF NEW RATES

Beginning and during the first year, 36 cents an hour.

Beginning and during the second year, 37 cents an hour.

Beginning and during the third year, 38 cents an hour.

Beginning and during the fourth year, 39 cents an hour.

Beginning and during the fifth year, 39½ cents an hour.

Beginning and during the sixth year, 40 cents an hour.

Beginning and during the seventh year, 40½ cents an hour.

Beginning and during the eighth year, 41 cents an hour.

Beginning and during the ninth year, 41½ cents an hour.

After the end of the ninth year of continuous service, 42 cents an hour.

This wage scale is to apply to the wages of certain employees, between March 1 and June 1, 1918, as set out in section 1 of the terms of the agreement.

INCREASE IN OTHER DEPARTMENTS

United Railways officials estimate that the combined increase to carmen, mechanical, reconstruction and other employees will cost the company $1,400,000 yearly. President McCulloch's order increasing the pay of shop and roadbed men concludes as follows:

"The company is making this increase by reason of the decision of the Public Service Commission of Missouri authorizing the company to increase its rate of fare on June 1."

Strikes in New York State

The trainmen in the employ of the United Traction Company in Albany, Troy, Watervliet, Green Island, Cohoes and Rensselaer in New York went on strike on June 3, but returned to work the following morning.

The settlement agreement was reached after a ten-hour conference, which terminated shortly after 4 a.m. Participants in this included, besides representatives of the company and the men, Walter A. McClatchy, federal housing agent for the Watervliet arsenal, and Mayor James R. Watt.

The trainmen, who struck for an increase in wages of 9 cents an hour, were granted an increase of 6½ cents an hour. Other employees covered in the agreement are to receive a 20 per cent increase. The question of additional pay, not to exceed 40 cents an hour, will be settled by the War Labor Board.

The employees of the Schenectady Railway went on strike the previous morning, but in this case the negotiations for a settlement were not so successful. Up to June 4 the men in that city were still out. They also demanded a 9-cent wage increase. The company there offered the men 4 cents additional. Efforts to apply to Schenectady the same terms of settlement as agreed upon for Albany failed.

D. U. R. War Attitude Stated

Frank W. Brooks, president of Detroit (Mich.) United Railway, has issued a statement on the proposal of the municipal authorities for federal control of the company's lines. Decision to ask the national government to take over the system followed an intimation from the company that it might be necessary to ask for an increased rate of fare. Mr. Brooks said:

"In common with other business undertakings, we are trying to adjust ourselves to the changing conditions with respect to both the labor shortage and the growing costs of everything and to meet the requirements of the munition factories and other war industry plants. We have already extended tracks to the Dodge Brothers ordnance plant and are now making extensions to the Ford shipbuilding plant.

"Of course, if the federal government in its wisdom wants to take over our 900 miles of railways, we will very willingly lend every aid we can. In fact, we will be glad to have the government take everything we own, if it will help win the war."

Reading Strike Settled

All differences between the striking trainmen of the Reading Transit & Light Company, Reading, Pa., and the company have been adjusted, and the cars resumed operation on May 28. The strike was settled after a series of conferences between the company and representatives of the men brought about by William Young, chief mediator of the State Department of Labor.

Under the adjustment eight dismissed employees have been reinstated and all the men now in the service of the company have been granted an increase in wages to 34 cents an hour. Any man employed after June 1 will receive 32 cents an hour for the first year, 33 cents an hour for the second year and 34 cents an hour for the third year. An advance of another cent will go into effect on Jan. 1, 1919.

The company refused to recognize the trolleymen's union, but expressed its willingness to receive committees of its employees at any time to adjust differences, with the explicit understanding that non-union employees shall be represented on such committees by at least three members. The company will continue to employ men regardless of whether they are members of the union and there is to be no attempt at interference with the company's enforcement of discipline.

The men went on strike on May 22 following the refusal of the company to meet a demand for an increase in wages of 6 cents an hour.

Strike in Northern New Jersey

On the morning of June 6 the trainmen in the employ of the Public Service Railway on its lines in Northern New Jersey went on strike. The territory which was affected included Newark, Jersey City, Hoboken, Paterson, Passaic and other places.

The walkout was due to the company's refusal to grant the conductors and motormen a flat rate of 45 cents an hour and 65 cents an hour overtime. The company offered a rate of 30 to 40 cents an hour—30 cents an hour to men who had been in the employ of the company six months; 35 cents an hour to men employed from six months to five years, and 40 cents an hour to those in the service more than five years.

Just outside of Newark are three great shipyards that are working in day and night shifts to speed up the shipbuilding program. Many other war industries also are in the territory affected. The company did its best to restore service promptly on the most important lines. In some cases volunteer workers from the shipyards operated cars to transport their fellow workmen.

Thomas N. McCarter, president of the railway, in a statement on June 6 charged that the strikers had been guilty of breach of faith. He recited the negotiations between the company and employees, and said that when the offer of the company was put to a committee of workers, that committee, after considering the proposition in private, agreed to accept the company's offer. Without word or warning, he said, the men met and repudiated the action of their own committee and walked out.

The company has had a considerable number of women in training for use in platform work, but they were not used to replace the men who went out.

Scranton Arbitration Under Way

After a week's idleness the striking trainmen of the Scranton (Pa.) Railway returned to work on June 2. The men decided to place their case in the hands of the National War Labor Board for an early adjustment. This decision was reached at a meeting held on June 1, after a telegram had been received from former President Taft and Attorney Frank P. Walsh, of the National War Board, declaring that by remaining on strike the men were violating the agreement between labor and capital upon which the War Board was founded. An offer to arbitrate the controversy was made with the statement that the award would be effective as of the date work was resumed.

Messrs. Taft and Walsh, chairmen of the board, met on Sunday, June 2, in Scranton. This meeting was attended by members of the executive committee of the union and officials of the railway. At this conference the attorney for the men sprung a surprise by requesting an increase of 40 per cent for men receiving 30 cents an hour or more and 50 per cent for men receiving a wage less than 30 cents an hour. The original demands were for a flat rate of 40 cents an hour for all conductors and motormen, regardless of how long they had worked for the company.

Mr. Walsh would not venture to predict how long it would take to settle the case. An expert examiner has been appointed to handle the details in Scranton. The company attorneys and representatives of the men will present the case to him. He will assemble the data and present them to the chairmen for final adjudication.

News Notes

Employees Accept Wage Increase.—The employees of the Morris County Traction Company, Morristown, N. J., have accepted a flat increase of 2½ cents an hour offered by the company, with a promise of a further increase on Sept. 1.

Connecticut Men Accept Compromise.—By a referendum vote the trainmen have accepted the compromise offered by the Connecticut Company, New Haven, Conn., which includes compensation ranging from 34 cents to 40 cents an hour. The time schedules will have to be adjusted to local conditions.

Wilmington Men Strike.—Employees of the Wilmington & Philadelphia Traction Company, Wilmington, Del., went on strike on May 31, but returned the following day on the company's promise to increase their wages 8 cents an hour at once, with a further increase of 2 cents if the company receives permission to increase its fares to 7 cents.

Increase in Pay for Camden Men.—The motormen and conductors on the South Jersey division of the Public Service Railway at Camden, N. J., have received an increase in pay of 2 cents an hour. The new rate went into effect on June 1. The beginners now receive from 28 cents to 30 cents an hour and the regular crews from 34 cents to 36 cents.

Wants Franchise Burdens Lifted.—The City Council of Seattle, Wash., recently received a communication from the Seattle & Rainier Valley Railway requesting an early conference with the Council regarding relief from franchise obligations, which the company declares cannot be much longer carried in the face of advancing prices of labor and materials. The matter has been referred to the committee on franchise and city utilities.

Course in Radio Communication.—On account of the urgent need of the government for men qualified to render special technical service in the Signal Corps, the University of Illinois will offer a course in radio communication during the summer session of 1918. This course is for men who wish to prepare themselves for research and development work or for field service in the Signal Corps of the Army. Instruction will begin on June 17, and will continue until Aug. 9.

Municipal Railway Bows to Men's Demands.—The threatened strike of the employees of the Brantford (Ont.) Municipal Railway was averted on May 30, when the men accepted the new rates of pay offered by the Railway Commission which operates the line. The old rates were 23, 25 and 26 cents an hour, for first, second and third year men respectively. The new rates will be 29, 31 and 32 cents an hour. A deficit is now very probable unless fares are raised.

New Offices for International Railway.—The offices of the International Railway, Buffalo, N. Y., have been moved from Ellicott Square to the Littell Building, corner of Huron and Franklin Streets. The railway company occupies the third floor and part of the second, and has about 50 per cent more office space than in the other building. This building was erected by H. H. Littell, a pioneer in the electric railway business. It has been remodeled for the accommodation of the new tenants.

New York Subway Labor Situation Met.—The threatened strike of laborers on subway construction contracts has been averted for the present by an agreement between the Public Service Commission for the First District and the authorities of New York City. Comptroller Craig has offered to finance the contractors in order that they may be able to meet the demands for higher wages made by the laborers. The adjustment between the city and the contractors will be arranged in the future.

Trenton Men Insist on Demands.—The trainmen in the employ of the Trenton & Mercer County Traction Corporation, Trenton, N. J., threaten to walk out after June 10 if the company does not grant their demands for an increase in wage. The traction corporation recently gave the employees an increase of 2 cents an hour, but the men say that the raise is not sufficient for them to meet the advancing cost of living. A meeting was held on June 3 following a conference with the traction officials and it was decided to take a vote on the question on June 10.

Employees Favor Fare Increase.—The motormen and conductors in the employ of the Pittsburgh (Pa.) Railways through the officers of Division No. 85 of their union, have made public a resolution commending the receivers in their effort to place the Pittsburgh Railways on a paying basis. The men say they feel that as every trade has received a substantial increase of wages within the last two years, there should be no hesitancy on the part of other workers to pay a cent or two extra for electric railway service, the cheapest commodity they can procure in the city.

Wage Increase in Birmingham.—A voluntary increase of 3 cents an hour has been made in the wages of its motormen and conductors by the Birmingham Railway Light & Power Company, Birmingham, Ala. This increase, which is the second since the war opened, brings the pay of the men to a minimum of 26 cents an hour, and a maximum of 33 cents, while the original contract between the company and the conductors and motormen called for a sliding wage scale ranging from 21 cents for the new employees to 28 cents an hour for those who have been in the service of the company for a number of years.

Commission Has Power Despite Franchises.—Attorney-General Brown of Pennsylvania has advised the Public Service Commission of that State that in his opinion the Legislature has given the commission power to regulate and allow increases in rates, notwithstanding the fact that municipal ordinances, granting franchises, may contain provisions fixing the charges that can be made. In concluding his communication to the commission Mr. Brown said: "Specifically answering your inquiry, I have now to advise you that the Public Service Commission of the Commonwealth of Pennsylvania does have the power legally to authorize a street railway to increase a rate of fare, notwithstanding the fact that that rate was specified by local authorities as a condition upon which they gave their consent to the company to construct its lines within the municipal limits."

Aurora-Elgin Wage Differences Settled—Through the efforts of business men of the community, a satisfactory agreement has been reached between the men and the Aurora, Elgin & Chicago Railroad, Wheaton, Ill. Negotiations lasted all day May 31. The men refused to accept an increase of 5 cents an hour. This the company stated was the greatest amount the financial condition of the property would permit it to offer. Business men came forward and placed themselves on record as being unanimously in favor of increased rates of fare for the railway. With this in mind an increase of 10 cents an hour was granted, but for the first three months the men will receive only half of the increase in cash. Within this time it is expected that the Public Utilities Commission will grant the company the right to increase fares, and as soon as this is done the men will receive the 50 per cent of the increase previously withheld. By the new agreement the men will receive from 34 to 46 cents an hour and an additional 5 cents an hour for overtime.

Programs of Meetings

Illinois Electric Railways Association

The Illinois Electric Railways Association will hold its annual meeting at the St. Claire Country Club, St. Louis, Mo., on June 20. Breakfast for the members attending will be served in St. Louis at the Missouri Athletic Club. Britton I. Budd, president of the Chicago Elevated Railways, and member of the War Board of the American Electric Railway Association, will speak on the activities and work of the War Board in connection with electric railways. Following this there will be a general discussion of the present conditions under which railways are operating. Lunch will be served at the Country Club, and those desiring to leave in the afternoon may do so. It is expected that the majority will remain, however, as golf at the club constitutes the program for the afternoon. The meeting planned for June 20, will take the place of the regular annual meeting usually held in January, but postponed this year.

New York Electric Railway Association

Replies already received indicate a very large attendance at the thirty-sixth annual meeting of the New York Electric Railway Association at the Hotel Champlain, Bluff Point, Lake Champlain, N. Y., on June 22. As stated previously in the ELECTRIC RAILWAY JOURNAL the supper, which will take the place of the annual banquet, will be addressed by Ex-President William Howard Taft and William H. Edwards, collector of internal revenue for the second district of New York.

There will be only one formal paper. It will be by Prof. Thomas Conway, Jr., of the University of Pennsylvania, and will deal with the financial condition of the different properties and the burdens under which they are struggling. Representative railway men, bankers and manufacturers have been invited to attend and discuss the situation from their different standpoints with the purpose in mind of suggesting remedies that might be applied and the policy that should be pursued by the companies to accomplish the results desired.

Financial and Corporate

What Federal Financing Requires

War Finance Corporation Tells Why It Granted a Direct Advance of $3,235,000 to St. Louis Company

The ruling of the War Finance Corporation on May 28 that its resources are intended to be loaned directly to war industries only in exceptional cases and upon adequate security, and its approval on the same day of an advance to the United Railways, St. Louis, Mo., have been causing much discussion in regard to what requirements are necessary to bring a utility under the exception clause of the act. The situation has now been somewhat cleared up by the issuance of a statement from the corporation in regard to the reasons for its action.

It appears that the points which actuated the corporation in granting the St. Louis advance were these: (1) the war work being performed by the company; (2) the short term of the loan; (3) the high-class collateral furnished, and (4) the prospect that the company itself will be able to handle the financing permanently through regular banking channels at the expiration of the temporary relief.

Up to the time when the War Finance Corporation issued its ruling, about 196 applications for direct aid had been received from utilities. No details have been announced in regard to the companies concerned, the policy of the corporation being to give out notice of only loans approved. It is believed by competent observers, however, that most of the pending applications will not receive favorable action, for the companies are not likely to fulfill the requirements for treatment as exceptional cases. How any individual utility will fare, however, will, of course, depend upon the facts in its particular case.

Reasons for St. Louis Advance

As stated in the preliminary note in the ELECTRIC RAILWAY JOURNAL of June 1, the direct loan of $3,235,000 to the United Railways of St. Louis is for six months at 7 per cent and is secured by $800,000 of 3½ per cent Liberty Loan bonds, and by the entire issue of $3,500,000 of first mortgage 6 per cent bonds of the Union Depot Railroad.

Based upon a valuation recently placed by the Missouri Public Service Commission upon the United Railways, the property covered by the mortgage of the Union Depot Railroad is said to be worth more than double the amount of the advance made by the War Finance Corporation.

The official statement of the War Finance Corporation says that the corporation was glad to make the loan for the following reasons:

"The United Railways serves many industries now engaged in work both necessary and contributory to the prosecution of the war.

"The security offered is in kind and value adequate under the meaning of the war finance corporation act.

"It is a short-time loan, which, because of the high class of collateral secured, is certain to be liquidated at maturity, and the temporary relief granted by this advance will give the company opportunity to make permanent financial arrangements through regular banking channels.

"The Missouri Public Service Commission has authorized an increase in fare now in effect from 5 to 6 cents, which will tend to enable the United Railways to meet the increased cost of material, increased taxes and large increases in wages recently granted to its employees.

"An ordinance was recently passed by the City of St. Louis by which all controversies between the city and the United Railways were settled and which provided a working basis between the city and its principal public utility that seems fair both to the people and to the company."

No Federal Funds for New Orleans

The New Orleans Railway & Light Company, which had $4,000,000 of two-year 6 per cent gold debentures falling due on June 1, was unable to meet its obligations, according to an announcement made by President D. D. Curran. The reason was the refusal of the War Finance Corporation, upon which the company had relied, to advance the necessary funds. In a circular letter to the noteholders President Curran requested an extension and promised that interest would be paid promptly.

President Curran's letter to holders of the debentures follows in part:

"Greatly to our surprise, after hearings over a period of ten days before the War Finance Corporation at Washington, that board suddenly issued a ruling to the effect that 'the resources of the corporation are not intended to be loaned directly to war industries, but only indirectly through the banks.'

"In these hearings the company's showing was apparently very satisfactory. This is further evidenced by the War Finance Corporation engineer's report on the physical property, the condition in which it was maintained, and the relationship with the public authorities and its patrons.

"In spite of the abnormal operating conditions and greatly increased operating expenses, the company's earnings for the twelve months ended Dec. 31, after payment of all underlying interest, showed approximately three and a half times the amount required for interest of these debentures.

"A further statement will be issued at an early date with regard to the terms of the proposed extension. In the meantime holders are requested not to present their debentures for payment of principal. Under these circumstances we request your active and friendly co-operation."

Interborough Applies

Application has been made to the War Finance Corporation by the Interborough Rapid Transit Company, New York, N. Y., for a loan of $37,700,000 for a period of three years. The money is needed for completing the equipment of the new subways and for elevated extensions. The loan, if granted, is to be secured by $39,489,000 of first and refunding mortgage 5 per cent bonds of the company. The Public Service Commission has stipulated that the company shall not issue the bonds to net less than 93½ per cent.

Revenue Hearings Began on June 6 in Washington

The ways and means committee on May 29 fixed June 6 as the date for beginning public hearings on the new revenue bill and tacitly sanctioned a plan for a brief recess while the revenue measure is in the making.

The plan approved by the ways and means committee calls for a recess during July, on the theory that the revenue measure will be completed in committee on Aug. 1, with passage of the bill in the House by the middle or last of August, and a recess of the House while the bill is under debate in the Senate. Leaders are of the opinion, however, that the measure cannot be ready for the President's signature before late in October.

In a statement after the committee meeting on May 29, Chairman Kitchin announced that the revenue measure would follow the general trend outlined by President Wilson in his recent message to Congress urging the new levies. Chairman Kitchin's statement, which also outlined the rules which will govern the committee's public hearings, follows:

"The committee on ways and means announced to all concerned that it will hold public hearings at Washington beginning June 6, 1918.

"It is deemed necessary largely to increase the revenue from taxation. It seems to the committee that it will be necessary to raise the needed increased revenue chiefly from taxes upon incomes, excess or war profits, luxuries and semi-luxuries.

"In order to avoid duplication of arguments and suggestions it is requested that persons having the same problem to present will agree upon one representative to present their views.

"The hearings will be conducted in the hearing room of the committee, 321 House office building. Persons desiring to be heard should if possible apply to the clerk of the committee previous to the date set for the hearings for an assignment of time."

American Cities Net Drops

The combined income statement of the constituent companies of the American Cities Company, New York, for the year ended Dec. 31, 1917, as follows:

	1917	1916
Gross earnings from all sources.....	$16,670,444	$15,464,361
Operating expenses and taxes †.....	11,145,998	9,965,083
Net earnings.....	$5,524,446	$5,499,278
Interest, bond discount, amortization and miscellaneous.....	3,895,499	3,810,259
Net income applicable to dividends..	$1,628,947	$1,689,019

†Renewal and replacement reserve included.

The gross earnings of the constituent companies in 1917 increased $1,206,083 or 7.9 per cent, but the operating expenses, taxes and renewal and replacement reserve increased $1,180,915, while deductions increased $85,240. The result was a decrease of $60,072 in the income available for dividends on stock. The operating ratio in 1917 was 57.58 per cent as compared to 55.71 per cent in 1916.

If the proportionate interest of the American Cities Company in the undivided surplus earnings of the constituent companies were added to the surplus earnings for the year, the result for 1917 would be $878,421. The parent company controls city lines in Memphis, the lighting property at Houston and the railway and lighting properties in New Orleans, Birmingham, Little Rock and Knoxville.

Allen & Peck Reorganized

C. Loomis Allen has announced his retirement from Allen & Peck, Inc., Syracuse, N. Y., operators and managers of public utilities, of which he was the head. Allen & Peck, Inc., has been reorganized into Peck-Shannahan-Cherry, Inc., with J. N. Shannahan of Hampton, Va., as president. The other new officers are: Vice-presidents, E. F. Peck, Hampton, Va., and T. C. Cherry, Syracuse; secretary and treasurer, Milford Badgero of Rochester.

Peck-Shannahan-Cherry, Inc., has taken over from Allen & Peck, Inc., the railway properties: Rochester & Syracuse Railroad, Inc., Auburn & Syracuse Electric Railroad, Syracuse Northern Electric Railway Company (South Bay line), Syracuse & Suburban Railroad. Newport News & Hampton Railway, Gas & Electric Company, Maryland Electric Railways, Annapolis.

Mr. Allen is to continue in the electric railway business in Syracuse, individually, as an engineer and manager. He will have an office in the executive headquarters of the Syracuse & Suburban Railroad in the Vinney Building.

Judge Dodge in the United States District Court at Boston, Mass., has authorized Receiver Donham of the Bay State Street Railway to issue two notes of $26,817 each, payable on Sept. 1 and Dec. 1, 1918, respectively, in payment of the balance due on a premium of $107,271 on a contract for workmen's compensation insurance.

Financial News Notes

Sold Under Foreclosure.—The property of the Eastern New York Railroad, Ballston Spa, N. Y., has been sold at mortgage foreclosure sale to I. W. Wiswall for $25,000. The road consists of 15 miles of line.

Authorized Capital Increased.—The Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y., has filed a certificate at Albany, N. Y., increasing its authorized capital stock from $200,000 to $400,000.

Small North Dakota Property Scrapped—The property of the Northwestern Traction Company, Brazil, N. D., the successor to the Brazil, Devils Lake & Minneapolis Electric Railway, has been scrapped. The company operated 5 miles of standard gage road between Devils Lake and North Chautauqua.

Receivers for a Pennsylvania Line.—R. W. Day and C. R. Bedford have been appointed receivers for the Scranton & Binghamton Railroad, Scranton, Pa., on application made by the Binghamton (N. Y.) Railway following a statement of President A. J. Connell admitting that the company could not meet interest due on June 1, amounting to about $70,000.

Part of Road Reclaimed.—W. H. Foster, Mayor of the city of Elkhart, Ind., has purchased the Jackson Street portion of the St. Joseph Valley Railway, sold under foreclosure in April, and is now operating cars on it, giving a twenty-minute service. It was the purpose of Benjamin Harris & Company, Chicago, Ill., the purchasers at the foreclosure sale, to dispose of the property as junk.

Receiver for New Hampshire Road.—Judge H. H. Blanchard, Springfield, Vt., has been appointed temporary receiver of the Springfield (Vt.) Electric Railway. Last November $100,000 of the company's bonds became due, but were not redeemed. The present is a friendly proceeding and is expected to bring about a reorganization of the company, of which E. C. Crosby, Brattleboro, is president.

Kankakee Company Would Sell.—A petition has been filed by the North Kankakee Electric Light & Railway Company, Kankakee, Ill., to sell its depot property and other facilities to the Chicago & Interurban Traction Company, Chicago, Ill., operating to Kankakee. A petition to purchase the property has been filed with the Illinois Utilities Commission by the Chicago & Interurban Traction Company.

Maine Road Ordered Sold.—A decision by the Public Utilities Commission of Maine authorizing the sale at public auction of the Rockland, South Thomaston & St. George Railway, Rockland, has been announced by S. T. Kimball, recently appointed receiver. The road has not been in operation for five months. The owners claim it has lost money steadily because of automobile competition. The receiver values the property at $50,000. The road is 5.7 miles long.

Additional Mahoning Fives—Lee Higginson & Company, Boston, Mass., Drexel & Company, Reilly, Brock & Company, Graham, Parsons & Company and Montgomery & Company, Philadelphia, Pa., are offering at 94 and interest, to yield 7.65 per cent, an additional block of $600,000 of first and consolidated mortgage 5 per cent bonds of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, due in 1920, making at present outstanding $10,600,000.

Survey of Traffic Will Decide Abandonment.—A careful study is being made of the revenue and expenses of the main line of the Rutland Railway, Light & Power Company, Rutland, Vt., west of West Rutland and the South Belt line operated in the city of Rutland. These two divisions have been operated at a loss for several years, and unless the expense of operation can be materially decreased, or revenue increased, the only solution may be to discontinue the operation and sell the material.

$614,000 Three-Year Notes Authorized.—The Cumberland County Power & Light Company, Portland, Me., which owns all of the common stock of the Lewiston, Augusta & Waterville Street Railway, has been authorized by the Maine Public Utilities Commission to issue not exceeding $614,000 of three-year 7 per cent notes dated June 1, 1918, in exchange for an equal amount of 5 per cent notes of the Lewiston company, due on June 1, the latter secured by the first and refunding 5 per cent bonds to the amount of $858,000.

Pittsburgh-Butler Lease Discounteranced.—The Pennsylvania Public Service Commission has refused the application of the Pittsburgh, Harmony, Butler & Newcastle Street Railway. and the Pittsburgh, Mars & Butler Railway for the lease of the latter company to the former on the ground that approval of the proposed lease "is neither necessary nor proper for the service, safety, accommodation and convenience of the public," and that the rental proposed is excessive, consisting of interest on $900,000 of bonds and certain specified dividends on stock.

Successor Company Organized.—The Northern Cambria Railway has organized as the successor to the properties of the Northern Cambria Street Railway, Patton, Pa., recently sold to satisfy a mortgage. The property will be operated as before, with slight changes in management. Officers and directors of the successor company are: President, W. H. Denlinger, who was also president of the old corporation; Rem-

brandt Peal, vice-president; James H. Allport, Barnesboro, secretary-treasurer. The directors are F. H. Barker and Attorney P. J. Little, Ebensburg; W. B. Adair, Pittsburgh, and William Eigler, Clearfield, Pa.

No Action Taken on Common Dividend.—The directors of the American Railways, Philadelphia, Pa., on May 24 took no action on the dividend on the common stock. On Dec. 15, 1917, 2 per cent was paid. Out of an issue of $9,460,000 of common stock, $6,429,500 has been pledged to secure an issue of a like amount of collateral trust notes, issued by the National Properties Company, which are entitled to interest at the rate of 4½ per cent from Jan. 1, 1918, to 1920. It is said that the interest on these notes will be paid at the next period regardless of the loss of income through the passing of the dividend on the common stock pledged to secure the notes.

Short Illinois Road Suspends.—The Woodstock & Sycamore Traction Company, which has been operating a railway by gasoline power between Sycamore and Marengo, Ill., via Genoa, for several years, has suspended service. It is expected land occupied by the right-of-way, which was nearly all donated by adjacent property owners, will revert to them. On May 22 a decree of foreclosure was entered in the Circuit Court of DeKalb County, in the case of the Central Trust Company of Illinois against the railroad. The decree orders the sale of the property, rights and franchises of the company. The road was built with the idea in mind of equipping it for operation by electricity.

Bondholders Purchase Northern Electric.—The property of the Northern Electric Railway, Chico, Cal., was purchased at public auction at Sacramento, Cal., on May 28 under foreclosure proceedings, for $1,750,000, by the reorganization committee of bondholders, represented by Walter Mansfield, San Francisco attorney. The price paid was the minimum set by United States District Judge Dooling of San Francisco, when he fixed the date for the sale. The only bid made was by Mr. Mansfield, who with O. K. Cushing and George S. Deitrick, attended the sale as representatives of the reorganization committee. The committee has obtained authority from the State Railroad Commission to issue $5,500,000 of bonds and $5,200,000 of stock, the sale of which is subject to approval by the commission.

Electric Locomotive Costs of New York Central.—According to the annual report of the New York Central Railroad for the calendar year 1917, the company at the end of the year had in service seventy-three electric locomotives, of which fifty-two were owned and twenty-one were held under equipment trusts. The revenue locomotive-miles (electric) during the year were 2,163,024, an increase of 13,248, as compared to 92,085,932 locomotive-miles (steam), a decrease of 1,883,689. The non-revenue locomotive-miles (electric) totaled 11,125, a decrease of 424, while the non-revenue locomotive-miles (steam) amounted to 3,162,241, an increase of 196,717. The cost of repairs per locomotive-mile (electric) was 4.01 cents in 1917 as compared to 3 cents in 1916, while the cost of repairs per locomotive-mile (steam) was 9.86 cents in 1917 and 7.56 cents in 1916.

Indianapolis Security Holders Anxious.—The Association of Indiana Security Holders of the Indianapolis (Ind.) Street Railway, operated under lease by the Indianapolis Traction & Terminal Company, has been formed by the bond and stockholders of the company to look after their interests. J. F. Wild, president of the J. F. Wild State Bank, Indianapolis, was chosen chairman of the organization meeting. A general discussion of the railway situation in Indianapolis was made a part of this meeting. The general purpose of the meeting was to perfect a permanent organization. Higher fares were suggested as a necessary step in the proper adjustment of the situation. A committee composed of Mr. Wild, Robert Elliott and Samuel Reed was appointed to confer with Robert I. Todd, president of the company, with a view of arranging some way out of the embarrassment caused by the recent default in the payment of the license fee due to the city of Indianapolis from the company.

Mortgage for $5,000,000 Authorized.—The Public Service Commission of the Second District of New York has granted an order authorizing the Southern New York Power & Railway Corporation, Cooperstown, N. Y., to execute and deliver to the Equitable Trust Company, New York, as trustee, a mortgage on its property to secure first mortgage ten-year bonds amounting to $5,000,000. An issue of $1,000,000 in bonds is authorized, of which $952,000 shall be exchanged for $1,085,000 first mortgage bonds of the company issued under its former corporate name, the Otsego & Herkimer Railroad, and the bonds thus redeemed to be canceled. Bonds for $48,000, or their proceeds, are to be used for acquiring a like amount of capital stock of the Southern New York Power Company, formerly the Colliers Light, Heat & Power Company, the order also providing that a like amount of bonds shall be canceled. The commission has also canceled authority to execute a mortgage for $10,000,000 and issue 5 per cent bonds under an order granted on Oct. 19, 1916.

Electric Railway Monthly Earnings

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$39,516	*$30,124	$9,392	$6,534	$2,858
1m., Mar., '17	33,753	*20,905	12,848	6,552	6,296
12m., Mar., '18	476,976	*327,068	149,908	78,600	71,308
12m., Mar., '17	407,386	*237,115	170,271	78,553	91,718

COLUMBUS (GA.) ELECTRIC COMPANY

1m., Mar., '18	$96,195	*$41,609	$54,586	$32,658	$21,928
1m., Mar., '17	87,851	*33,907	53,944	28,350	25,594
12m., Mar., '18	1,139,255	*444,655	694,600	370,623	323,977
12m., Mar., '17	936,494	*362,619	573,875	342,788	231,087

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

1m., Mar., '18	$215,591	*$139,579	$76,012	$38,608	$37,404
1m., Mar., '17	157,469	*112,719	44,750	36,417	8,333
12m., Mar., '18	2,210,888	*1,452,073	758,815	457,659	301,156
12m., Mar., '17	1,953,072	*1,254,997	698,075	439,695	258,380

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

1m., Mar., '18	$31,834	*$17,356	$14,478	$4,909	$9,569
1m., Mar., '17	30,497	*19,606	10,891	5,026	5,865
12m., Mar., '18	346,535	*217,564	128,971	60,925	68,046
12m., Mar., '17	334,706	*194,572	140,134	62,948	77,186

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

1m., Apr., '18	$577,897	*$273,528	$304,368	$216,907	$87,461
1m., Apr., '17	524,053	*244,504	279,549	217,880	61,669
4m., Apr., '18	2,280,554	*1,129,244	1,151,310	869,528	281,782
4m., Apr., '17	2,107,514	*954,778	1,152,736	869,179	283,557

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

1m., Apr., '18	$3,539,667	*$2,013,570	$1,526,097	$1,180,511	‡$611,941
1m., Apr., '17	3,521,020	*1,693,020	1,827,000	1,019,545	‡$874,468
10m., Apr., '18	33,683,685	*18,910,561	14,773,124	11,179,186	‡$6,213,721
10m., Apr., '17	33,097,412	*16,058,579	17,038,833	10,019,631	‡$7,615,132

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$2,642,090	$1,634,502	$1,007,588	$814,126	$193,462
1m., Apr., '17	2,456,300	1,382,948	1,073,352	813,746	259,606
10m., Apr., '18	25,060,549	15,132,617	9,927,932	8,125,650	1,802,282
10m., Apr., '17	23,457,395	13,162,273	10,295,122	8,142,214	2,152,908

PHILADELPHIA & WESTERN RAILWAY, UPPER DARBY, PA.

1m., Apr., '18	$45,804	$26,958	$18,846	$14,083	$4,762
1m., Apr., '17	45,645	22,683	22,962	12,518	10,444
12m., Apr., '18	583,690	314,664	269,026	162,736	106,290
12m., Apr., '17	529,604	256,999	272,605	150,479	122,126

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

1m., Mar., '18	$965,911	*$581,508	$384,403	$207,665	$176,738
1m., Mar., '17	768,418	*478,629	289,789	191,724	98,065
12m., Mar., '18	10,023,684	*6,201,638	3,822,046	2,396,774	1,425,272
12m., Mar., '17	8,461,666	*5,206,585	3,255,081	2,234,954	1,020,127

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

1m., Apr., '18	$463,035	*$329,064	$133,971	$98,424	‡$41,396
1m., Apr., '17	368,125	*250,175	117,950	80,425	‡47,430
12m., Apr., '18	5,297,194	*3,696,383	1,600,811	1,023,563	‡617,501
12m., Apr., '17	4,183,498	*2,565,525	1,617,973	881,749	‡762,344

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Apr., '18	$776,967	$555,212	$221,755	$155,560	$66,194
1m., Apr., '17	839,072	534,447	304,625	045,402	159,223
4m., Apr., '18	3,234,357	2,436,302	798,055	621,690	176,365
4m., Apr., '17	3,480,984	2,333,906	1,147,078	580,471	566,607

* Includes taxes. ‡Includes non-operating income. § Includes accruals under rapid transit contracts with city payable from future earnings.

Traffic and Transportation

Milwaukee Fare Five Cents

Commission Decision Places Entire Single-Fare Area on This Basis —Other Rates Undisturbed

On the night of June 1 the Railroad Commission of Wisconsin handed down its decision on the appeal of the Milwaukee Electric Railway & Light Company for an increase in fares. At 10 o'clock it put the decision into the hands of officials of the company, and at midnight the orders of the commission went into effect.

New Rate Effective June 9

The decision prohibited the sale of tickets after midnight on June 1, and their being honored by the company on its cars after midnight of June 9. It provides that the company shall redeem the tickets on a cash basis from midnight, June 9, to midnight, July 9, at the rate of 4 cents each, and, if more than three are offered for redemption they shall be redeemed at the rate of four for 17 cents, five for 21 cents and six for 25 cents.

While the decision mentions specifically that zone fares, children's fares and suburban fares are not to be disturbed, no mention is made of transfers. In the statement issued by the commission on the increase in fares, it says:

"In substance, this decision places the entire single fare area on a 5-cent basis. Children's fares and zone areas are not disturbed. Rates for suburban traffic within the suburban areas are not changed.

"The commission, to a large extent, has adopted the position of the city attorney as to principles to be used in arriving at a valuation, although the valuation arrived at exceeds the amount claimed by the city.

"In another proceeding, the commission is at this time considering the matter of electric railway service in Milwaukee, which is also brought in issue by the pleadings of these proceedings. It is the fundamental obligation of a public utility to furnish adequate service to the public, and the company is required to give this matter immediate consideration.

"On the whole, the commission finds that an emergency condition exists, which must be met by an increased revenue."

Petition Filed in 1915

The order was in response to the company's petition for the adjustment of city and suburban fares filed on Nov. 6, 1915. The commission ascertained that the valuation of the railway, electric and heating utilities of the city company on Jan. 1, 1914, was $26,093,372 and the investment value $26,160,742. The commission also found that the railway investment in the single-fare area, including the property of the traction company therein on Jan. 1, 1917, was $17,660,970, exclusive of material and supplies, for which $500,000 was allowed. The commission excluded items carried by the company into operating expenses for fore-shortened life and charged the same against the depreciation reserve. It estimated depreciation at 3 per cent on depreciable property, with 4 per cent interest on reserve balances. Taking 1916 adjusted operating expenses, and with this allowance for depreciation, the commission estimated that with 1916 revenues and 1918 probable expenses the company would earn 7.24 per cent to 7.6 per cent on the investment with a 5-cent cash fare. The commission made no order respecting the suburban fares, stating this matter was still under investigation. The company estimates the return with a 5-cent fare without any allowance for further increases in costs about 6.75 per cent.

An interview with James D. Mortimer, president of the company, in which he comments on the Milwaukee decision and the general outlook for public utilities, is published on page 1092 of this issue.

I. T. S. Restores Service

The Illinois Traction System announced revised summer passenger schedules effective on Sunday, May 26. The new time card contained changes in train time on all divisions and is considered an improvement over that which has been in effect since last February, when the company was compelled to revise its train service owing to abnormal conditions existing then.

Limited service is restored on the main divisions and in many cases the running time of local trains is shortened. Parlor car service between Peoria, Springfield and St. Louis is restored. The time between Peoria and St. Louis for the two parlor car trains is cut down to six hours. In addition to the parlor car limiteds provision is made for two additional limited trains each day between Springfield and St. Louis.

On the Peoria-Bloomington-Decatur division there will be two limited trains daily in either direction in addition to the local trains, which will run from terminal to terminal without change. A series of limited runs is also provided between Bloomington and Mackinaw Junction making direct connection with trains on the Peoria-St. Louis division.

Through limited service between Springfield, Decatur and Champaign is also provided and the running time of local trains between these points is shortened.

N. J. Fare Argument June 12

Direct Testimony All In, New Jersey Commission Will Hear Oral Argument at Newark

Counsel for the company and for the municipalities opposing the application of the Public Service Railway to the Board of Public Utility Commissioners for permission to charge a 7-cent fare with 2 cents for a first transfer and 1 cent for a second transfer have begun the preparation of their argument on the evidence submitted and it will be heard by the commissioners at Newark on June 12. President Thomas N. McCarter will appear for the railway and both Marshall Van Winkle and George L. Record will be heard for the municipalities opposing the proposed increase.

Case Concluded on May 30

The original plan of the company called for the presentation of testimony in rebuttal, but this was not followed, and the case was concluded on May 30 with a short cross-examination of Dr. Delos F. Wilcox, public utility and franchise expert, who appeared as the chief witness for the opposition. When the direct testimony of Dr. Wilcox ended, David F. Atkins, electrical engineer, took the stand for cross-examination.

After a brief conference with Commissioner Slocum, Commissioner March set the date for the argument and stated that each side would be given one hour and a half, with two hours as the limit. Mr. Van Winkle will discuss the jurisdictional questions in his argument and Mr. Record will take up the other elements of the case.

The petition for the fare raise was filed with the board by the railway on March 5, and March 14 was fixed as the date for the first hearing. On March 11 the executive committee of the New Jersey League of Municipalities and lawyers representing municipalities met and, after deciding to oppose the application, employed Mr. Van Winkle as chief counsel. Mr Record was retained a few days later as Mr. Van Winkle's associate.

Brief Review of Hearings

When the opening hearing was called in Trenton on March 14, Mr. Van Winkle, aided by Corporation Counsel John Milton of Jersey City, secured a delay to March 26, when President McCarter took the stand as the railway's first witness. He was followed on subsequent days at hearings in Newark and in Trenton by other officials of the company and a number of experts. There was then an adjournment while Mr. Van Winkle and Mr. Record, representing the protesting municipalities, prepared for the cross-examination of the company's witnesses.

The presentation of the opposition's case began on May 22 with hearings on May 23 and 24, and it was continued on May 27. The board did not sit on May 28, but it reopened the hearing on May 29.

HOUSTON & CARNEGIE LYCEUM LIBRARY

Will Use Student Trainmen

Washington Railway & Electric Company Issues Circular to High School and College Students

Owing to the great inrush of war workers to Washington, D. C., which has taxed the capacity of the public utilities of the city to the limit, coupled with the difficulty of obtaining labor, the Washington Railway & Electric Company has decided to use student employees. Circulars are now being distributed among the schools and colleges, appealing to the patriotism of the boys. The school authorities, having heard of the success of a similar plan which has been carried out in Denver, are offering their friendly co-operation in this campaign, and a certain degree of success seems already to be assured.

The circular, which explains itself, reads, in part, as follows:

Do you want to serve your country and help to win the war?

Do you want to take the place of a man who has been drafted and taken from an occupation vital to the prosecution of the war, to offer his life for the cause of democracy?

Do you want to be a substitute for one who, in the opinion of our government, has reached the age at which he has physical resistance enough to stand the strain of actual warfare?

Do you want to do the work of a man who has been called upon to leave his job at home and stand the supreme test of his manhood by facing the guns of the enemy—a test which you yourself may later be called upon to stand, if all do not now strain their every energy to bring this war to a quick conclusion?

The Washington Railway & Electric Company, whose motormen and conductors are being called away to fight in numbers increasing all the time, is, like other public service corporations, in danger of having its man-power sapped by the draft to such an extent that it will not be able to give the service which this city, the center of the vast fighting machine, urgently requires.

The Washington Railway & Electric Company needs 100 high school boys or college students to take the places of men who are being called upon to fight.

The company offers the same money to boys as it pays to men—31 cents an hour to start.

Instruction for sixty hours is necessary as a preliminary, in a school for street car men and in actual training on the cars.

Other qualifications for this work are the alertness and enthusiasm with which most real American boys on the verge of manhood are endowed.

Desire for patriotic service is a stimulus.

Pleasant and healthful, but above all, useful and necessary, work is the result.

The material reward is that of a mature man.

The moral reward is that of a patriotic citizen.

If you would help, fill in the application form below and mail it to the Washington Railway & Electric Company, Traffic Department, Fourteenth and C Streets, Northwest, Washington, D. C.

The B. C. Advertising Policy

The advertising policy of the British Columbia Electric Railway, Vancouver, B. C., is set down in *The Buzzer*, published by the company, as follows:

"We do not advertise for any other purpose than to sell our service. To spend a larger amount than necessary would be unfair to the public, who have to pay the cost of the service. The papers and magazines used by us for advertising are chosen because they suit our purpose as advertising mediums, and not to hush up any criticisms of this company. On the other hand, we do not advertise in papers which insinuate that they will stir up public clamor if we do not.

"We are not afraid of criticism when it is just. We are willing and anxious for the public to judge for themselves. But publishing garbled reports of affairs and printing underhand, spiteful opinions about this company is just the same as the propaganda of Germany to stir up dissension among the Allies, to pervert public opinion and to prevent the formation of clear-cut, unbiased judgment based on facts.

"Just as Germany is fighting against democracy, these papers are fighting against good public service—your public service. If you want Germany to win, help along its propaganda. If you want these papers to succeed in their personal grudge against this company until the service is affected, support them—buy them and advertise in them."

Railway Voted a Six-Cent Fare

The proposal for an increase in the fare of the Sioux Falls (S. D.) Traction Company to 6 cents, submitted to a vote of the people on May 28, went "over the top" by a vote of 1180 to 894.

The election was conducted in real political style. Large cloth banners mounted on each side of the cars proclaimed that 1917 revenues would not pay 1918 expenses. Appeal was made to the public to vote "yes" for the 6-cent fare. Advertising cards suspended in the center of the cars were also used effectively. Good work in putting the proposition to the public was done by the platform men for a week in advance.

Publicity was given through newspaper talks for five days preceding the election. A special eight-page emergency edition of *On the Cars* was issued and election cards were distributed by employees and workers stationed at the polling places. Special cars were run to the packing houses and carried the men direct to the polls free of charge.

It was noted in the ELECTRIC RAILWAY JOURNAL for May 25, page 1032, that a resolution had been passed by the City Commission to submit the question of a 6-cent fare for the Sioux Falls Traction System to the voters at a special election that had been called for May 28.

This action was the direct result of a strike of the employees of the company about two months ago which resulted in a general tieup of service for two days. The men demanded an increase in wages from 22 to 27 cents an hour. The auditors' report for 1917 showed that the company could not grant the demand without imperiling its solvency. An investigating committee of citizens was named and suggested a 1-cent increase in fare, upon the strength of which report the wage increase was granted.

The company is pleased with the result of the election and with the cordial relation which exists between it and its patrons.

Atlanta Rate Hearing Begun

Commission Adjourns Case to June 12 After Two-Day Session Questioning Company's Officers

The hearing of the petition of the Georgia Railway & Power Company, Atlanta, Ga., for an increase in rates was opened on May 22 before the Railroad Commission of Georgia. Among other advances the company wants a 6-cent fare and 2 cents for a transfer.

The morning session was occupied with the reading of the petition, by J. Prince Webster, rate expert of the commission, and the arguments of Jack J. Spalding, principal attorney for the company, and the reply of W. A. Wimbish, attorney for the citizens' committee which is opposing the proposed increases in rates.

BURDEN OF PROOF ON COMPANY

At the conclusion of the statement by Attorney Wimbish, Chairman Candler of the commission announced that the burden of proof was upon the company to show that the increases which it seeks are justified by the facts in the case.

H. M. Atkinson, chairman of the board of directors for the company, took the stand as the first witness and gave an exhaustive analysis of the reasons advanced which he claimed render these increases absolutely necessary. The afternoon session was consumed by the conclusion of the testimony of Mr. Atkinson and his cross-examination by several of the attorneys representing opposing interests, and the testimony of Preston S. Arkwright, president of the company.

The hearing was continued on May 23 with Mr. Arkwright as the principal witness, but late on that day was adjourned until June 12. This was done upon representation of counsel for the city of Atlanta and the people's committee that they were unable to cross-examine Mr. Arkwright because they had not had access to the books and figures presented by the company. Counsel for the opponents stated that it would be impossible to proceed intelligently until the records of the company were produced for inspection.

COMPANY OBJECTS TO DELAY

Attorneys for the company objected to a request for postponement, and took exception to the statement of Mr. Watkins, of counsel for the people's committee, that the officers had exhibited any aversion to showing their figures. They contended that the company was asking for an increase as an immediate and emergency measure.

Testifying before the commission on May 23 Mr. Arkwright stated that the company's petition for an increase of 33⅓ per cent in all departments is only to meet an emergency and that when the emergency was over the company expected that the commission would again readjust the rates in accordance with the conditions as it found them at that time.

Blanket Increase in Indiana

Commission There Authorizes All Interurban Railways to Charge 2½ Cents a Mile

An order was issued by the Public Service Commission of Indiana on May 30, authorizing all interurban railways not heretofore granted increases in rates of fare to charge 2½ cents a mile instead of 2 cents, and to sell 1000-mile mileage books at the rate of 2 cents a mile effective on June 3. Increases to the 2½-cent rate had already been granted on petition and hearing, to the Union Traction Company of Indiana, Indianapolis & Cincinnati Traction Company, Chicago, South Bend & Northern Indiana Railway and the Marion & Bluffton Traction Company.

The commission regarded it as merely a matter of time until the other interurban electric lines in the State would file petitions for similar increases, and in view of the federal order increasing steam railroad rates to 3 cents a mile, it was deemed expedient to issue a general order covering Indiana.

The commission's order refers to the fact that the interurbans are placed in a perilous position by increased cost of operation, and that in many cases there has been a decrease in travel due to the improvement of the highways and the increased use of passenger automobiles and trucks which are doing a local freight business. The order indicates that if the 2½-cent rate should not prove sufficient after a fair trial, a further advance in passenger fares will be considered by the commission.

Pacific Electric Feels the Need

The Pacific Electric Railway, Los Angeles, Cal., wants to raise passenger rates on its lines radiating from Los Angeles, and reduce the number of trains in the city, in order to meet increased operating expenses, increased cost of materials and increased taxes.

The company has filed an application with the State Railroad Commission for authority to raise rates, and, it is announced, will file an application with the Los Angeles Board of Public Utilities for permission to reduce the number of trains.

In the application to the State Railroad Commission it is pointed out that the road has never paid dividends to stockholders, and permission is sought to raise rates sufficiently at least to enable the company to meet its annual fixed expenses. A schedule of the proposed new rates will be filed later. It is believed that an increase equivalent to 1 cent to 1½ cents per passenger will be necessary.

Though the Pacific Electric Railway is not under government control it planned to increase wages on June 1 of all employees receiving less than $250 a month. This is in line with the policy adopted by the government. In speaking of the proposed increase Paul Shoup, president of the road said:

"The Pacific Electric Railway has not been earning operating expenses, taxes and interest. The increased costs of labor and material for operation and maintenance, the jitney and the use of privately owned automobiles on good roads have been the chief causes contributing to this result. We ask that rates be increased in such amounts, that there will be returned a revenue sufficient to meet the annual fixed charges. Last year 73 per cent of our revenue came from passengers, who averaged 9 cents each. We get less than 1½ cents per mile per passenger, and our commutation rates probably do not exceed two-thirds of a cent per mile per passenger."

Fares Up on Wheeling Suburban

Upon the evidence submitted by the West Virginia Traction & Electric Company, Wheeling, W. Va., in connection with its application to the Public Service Commission of West Virginia to charge 6 cents on its railway lines and to do away with school tickets, the commission recently decided that the petitioner was not receiving a just rate of return on the fair value of that portion of its property devoted to the use of the public; that the fair value of the property for rate-making purposes was aproximately $1,000,000, and that an increase in its present rates from a 5-cent fare to 6 cents for each zone would under present conditions produce a reasonably fair rate of return. It was therefore ordered that the petitioner be authorized to cancel all monthly commutation rates, except school rates, and put into effect the following rates:

PASSENGER RATES

Wheeling to Elm Grove, or intermediate points	6 cents
Wheeling to Triadelphia	12 cents
Wheeling to Roneys Point	18 cents
Wheeling to Valley Grove	24 cents
Wheeling to West Alexander	30 cents

SCHOOL RATES—GOOD ONLY FOR MONTH ISSUED

Wheeling to Elm Grove	$1.40
Wheeling to Triadelphia	2.75
Wheeling to Roneys Point	4.15
Wheeling to Point Mills	4.15
Wheeling to Valley Grove	5.50
Wheeling to West Alexander	6.90
Elm Grove to Wheeling	1.40
Elm Grove to Triadelphia	1.40
Elm Grove to Roneys Point	2.75
Elm Grove to Point Mills	2.75
Elm Grove to Valley Grove	4.15
Elm Grove to West Alexander	5.50

Good only from 7 a.m. to 6 p.m. on school days.

Tickets issued to scholars upon certificates from school principals.

The petitioner was authorized to charge 1 cent for transfers to the Mount de Chantal division. The commission found that objections to the character of the service rendered by the company were sustained by the evidence but said that improvement in service is expected as a result of the increase in rates. The increase in rates is effective until further order of the commission. The company is ordered to keep an accurate account of the revenues derived and expenses incurred by it for a period of one year from June 1, 1918, and at the expiration of that period to file with the commission a detailed statement thereof.

The order of the commission became effective on May 10.

Alive to the Opportunity

Business Men of Southwest Discuss Matter of Truck and Electric Railway Transportation

At the war convention of the Inter-Community League of the Southwest, in Kansas City on April 24 and 25 every discussion of increased agricultural production or of industrial development in Kansas, Missouri and Oklahoma led back to transportation.

While there is considerable hauling of freight by truck in these States, regular service is maintained only over the very small mileage of rock roads. Merchants in small towns on electric railways are, however, in good position, since they are receiving their merchandise by the interurbans. The tendency to keep railroad freight cars off of short haul work is inclining merchants to seek delivery by interurbans to stations from which they can conveniently get goods to their stores by truck.

Comments during the session of the league indicated that there is prospect of development of business by jobbing houses in centers served by interurban electrics.

During the present halt in road improvement, communities are going to investigate their highway plans carefully to determine whether the roads to be improved should not be planned with reference to available interurbans, rather than with reference to long-distance automobile passenger travel. While freight transport by truck is feasible on regular routes, over comparatively short hauls, it is a problem to finance or operate a long route. It was pointed out that the joining of facilities of electric line and rock road would vastly extend high-class service.

The Inter-Community League, at its convention, made plans for getting information on the industrial resources of the three States. The league will maintain a committee, and possibly a traveling representative, to study and advise on industrtial questions, and a definite program of education towards improving the manufacturing resources will be carried on. Industrial commissioners of several railroads addressed the league. They will provide expert help in gaging industrial possibilities, and in arranging to get information that would be required by investors or manufacturers.

City Will Investigate

Tacoma's new City Council plans to investigate the railway service furnished by the Tacoma Railway & Power Company and the Pacific Traction Company. Since the decision of the State Supreme Court confirming cities' powers that were, in a measure, assumed by the Public Service Commission, it is possible that the proposed hearing which the Public Service Commission was to grant on transportation difficulties in Tacoma may be abandoned in favor of one in which the City Council will be the principal representative of the people.

Governor Confident of People

Executive of Tennessee Sees Hope of Relief for Public Utilities if They Prove Their Case

Tom C. Rye, Governor of Tennessee, has replied to T. H. Tutwiler, Memphis, chairman of the committee on public utility conditions for Tennessee, which recently appealed to the Governor to ask the co-operation of the public in helping the concerns to maintain their maximum efficiency in line with President Wilson's request for co-operation. The Governor says that he is convinced that the citizens understand and appreciate the conditions that obtain at present and that they will not withhold any concession necessary for the successful operation of the public utilities. He says in part:

THE GOVERNOR'S LETTER

"I am sure you will agree with me in the statement that the people should be required to pay only just and reasonable rates and charges so as to enable these corporations to render adequate and efficient service to the public and at the same time yield a reasonable return to the owners.

"While it is true that costs have increased to the utilities, I cannot ignore the fact that these corporations are acting and operating under certain franchises, charters and contracts with the cities, towns and people they serve, each limited to the powers conferred and duties imposed by the express terms of their different charters and contracts, and these are, in their nature, purely local.

"The right to change or alter the terms of these contracts belongs exclusively to the people directly interested. Therefore, I would not feel at liberty to assume to advise these interested parties as to what they should or should not do in the premises.

"Judging from my experience with the people, I am constrained to believe that all that is necessary in order to afford these corporations the relief to which they may be justly entitled is a clear presentation of existing facts with reference to each particular corporation so that the people may see and understand the reasonableness and the necessity for the changes asked. And when this is done, I confidently believe that those who are authorized to act will not hesitate to do so, and that relief will be given where the facts that relief will be given in such measure as the facts and circumstances would seem to justify."

The appeal to the Governor was reviewed in the ELECTRIC RAILWAY JOURNAL for June 1, page 1071.

Basis of Toronto Car Order Appeal

In the matter of the appeal of the Toronto (Ont.) Railway from the fine by the Ontario Railway & Municipal Board for not complying with its order to place in operation 100 new cars, the whole question of Provincial authority and power under "the British North America act" is raised.

Among the grounds of appeal may be briefly summarized the following:

That the order is not one which the board could make of its own motion.

That the Ontario Railway Board has no jurisdiction to make such an order, either on its own motion or on application.

That the evidence shows that the company did use its best effort to comply with the order to purchase 100 cars.

That the evidence shows that it was impossible to obtain the cars at the time of the order owing to war conditions.

That the company should not have been ordered to purchase such cars and the order was improperly made.

That the order is against the weight of evidence and contrary to law.

That the Legislative Assembly had no power to enact the railway and municipal board act, and that D. M. McIntyre and Andrew Ingram have not been validly appointed as commissioners under such act for making such orders, and have no jurisdiction to make the order complained of, upon the ground that the appointment of the said commissioners is not within the legislative authority of the Province of Ontario.

Hudson Tunnel Raises Fares

In conformity with general order No. 28, issued by the Director General, United States Railroad Administration, under date of May 25, 1918, there will be a general advance in all passenger fares of the Hudson & Manhattan Railroad, operating under the Hudson River between New York and New Jersey, and effective at 12.01 a.m., on June 10 the following rates of fare will apply on the lines of the company:

Between all stations in New York City (both uptown and downtown) and Jersey City and Hoboken, in either direction, a uniform fare of 10 cents will be collected. Between local stations on Sixth Avenue, New York City, the 5-cent fare will apply. All tunnel fares will be collected in cash, by deposit of the exact amount in the coin boxes at the entrances to stations. Between all stations in New York (both uptown and downtown), Jersey City and Hoboken and Newark, N. J., one-way tickets will be sold at 27 cents and half one-way tickets at 14 cents. Such tickets are valid only for continuous passage, without stop-over, in the direction first presented. Round-trip tickets will be discontinued.

The present charges are 5 cents for downtown passengers and 7 cents for uptown passengers. The Hudson & Manhattan Railroad was taken over by the government for operation by the Federal Railroad Administration on Jan. 1.

The company has announced that all commutation tickets will be honored until and including the date of their expiration.

Transportation News Notes

Bay State Rates Suspended.—The Public Service Commission of Massachusetts on May 31 ordered to be suspended until June 16 proposed changes by the Bay State Street Railway in rates of fares and in commutation and excursion tickets.

Muskegon Wants Six Cents.—The Muskegon Traction & Lighting Company, Muskegon, Mich., has petitioned the City Council for a 6-cent fare. The company is operating without a franchise. It sells twenty-eight workingmen's tickets for $1.

Seven-Cent Unit Proposed.—The Norfolk & Bristol Street Railway, Foxboro, Mass., has notified the Public Service Commission of Massachusetts that it will increase its fare from 6 cents to 7 cents, beginning June 29. The company operates 21 miles of line.

Milwaukee Northern Wants Higher Rates.—Demand for higher rates for interurban and city lines and for freight is presented by the Milwaukee Northern Railway, Cedarburg, Wis., in a petition which it has filed with the Wisconsin Railroad Commission.

Increase in Joint Rates.—The International Railway has filed a change in its tariff schedules affecting joint passenger traffic in connection with the Buffalo, Lockport & Rochester Railway. The new schedule shows increases in one-way and round-trip fares and chartered car rates to all stations.

Six-Cent Fare for White Plains.—The Common Council of White Plains, N. Y., has granted permission to the Westchester Street Railroad to charge a fare of 6 cents. The permit is temporary and will have effect between June 1 and July 31. At the end of the time the company is obliged to show an improvement in service.

Appeal from Six-Cent Order Disallowed.—The motion of the City Counsellor of St. Louis, Mo., for a rehearing of the case in which the Public Service Commission of Missouri recently granted the United Railways, St. Louis, permission to charge a 6-cent fare on lines in St. Louis, for the period of one year beginning June 1, has been overruled by the commission.

Another Road Adopts Six-Cent Unit.—The New Bedford & Onset Street Railway, New Bedford, Mass., on May 29 filed with the Public Service Commission of Massachusetts a new schedule of fares calling for an increase of from 6 cents to 7 cents. The new rates will become effective on June 30. Minor increases in ticket fares are also asked.

Worcester to Charge for Transfers.—The Worcester (Mass.) Consolidated

Street Railway has filed a new tariff with the Public Service Commission of Massachusetts proposing to increase the fare unit on all lines outside of the city of Worcester from 5 cents to 6 cents. Fares in the city of Worcester will be 5 cents, with 1 cent additional for each transfer issued.

Portland Rates Suspended Until Sept. 11.—The Public Utilities Commission of Maine has suspended, until Sept. 11, the establishment of higher fares on the Portland city system operated by the Cumberland County Power & Light Company under lease from the Portland Railroad. The company has now put in all its testimony, but that of the opposition has not entirely been heard.

City Protests Pittsburgh Zones.—The city of Pittsburgh, Pa., has protested to the Public Service Commission of Pennsylvania against the system of zone fares proposed by the Pittsburgh Railways. The city contends that the new rates, intended to become effective on June 20, are arbitrary, unreasonable, unjust and discriminatory. It professes to see in the changes an attempt by the receivers to find a ready means of meeting the various fixed and capital charges arising by reason of the present financial structure of the company.

Village Agrees to Fare Advance.—After obtaining an amendment to its franchise, the Hudson River & Eastern Traction Company, Ossining, N. Y., has increased the fare on its lines from 5 cents to 6 cents. The company recently increased the fare to 7 cents, without the permission of the village officials, but following the decision of the Court of Appeals in the so-called Rochester case the company restored the 5-cent fare. Then the company sought permission of the village officials, who acquiesced in an advance of 1 cent.

Trenton Fare Hearing Under Way.—The hearing on the application of the Trenton & Mercer County Traction Corporation, Trenton, N. J., for a 6-cent fare over all its lines was set for continuation before the Board of Public Utility Commissioners on June 3. It was planned by the commission to proceed from day to day with the taking of testimony in the case, but Commissioner Slocum announced that because of other important matters pending before the board, it would be impossible to give more than one day of next week to the Trenton case.

Time-tables in Brooklyn Cars.—In accordance with an order of Public Service Commission for the First District of New York, all of the cars on the surface lines of the Brooklyn (N. Y.) Rapid Transit Company are carrying conspicuous placards containing a time-table, with the departure of each car and the time it is due at various points; the number of cars operated on each line, the number of each car, and the headway between cars. This is one of the results of the recent inquiry by the commission into alleged inadequate service in Brooklyn.

Albuquerque Goes to Six Cents.—At their meeting on May 21 the City Commissioners of Albuquerque, N. M., approved the proposal of the City Electric Company to raise railway fares from 5 cents to 6 cents. The commissioners, however, before they acted asked that the people approve the proposed ordinance, and requested the City Electric Company to initiate the legislation by filing with the commissioners the petition required by law, bearing a minimum of 670 signatures of qualified voters. This the company did.

Twin City Wants Fare Conference.—Horace Lowry, president of the Twin City Rapid Transit Company, Minneapolis, Minn., on May 31 sent a formal letter to the City Council asking consideration of the question of higher fares. This was in accord with Mr. Lowry's recent statement, following a presentation of the financial situation confronting the company. The letter does not ask that higher fares be granted. It asks rather that the Council grant a hearing at which the company may present its case in full detail for discussion.

Staggered Hours Being Urged.—The Kansas City (Mo.) Railways is advertising in its cars and in the newspapers to stimulate early shopping and especially early homegoing in order to reduce the traffic at the busy hours. The company is also discussing with managers of industrial plants the staggering of working hours to scatter the traffic morning and evening. City officials may be asked to assist in the attainment of this object although industrial plant managers generally are inclined to enter some sort of an arrangement for the distribution which the company desired.

Fare Raise in Manchester.—The Manchester (N. H.) Street Railway, included in the system of the Manchester Traction, Light & Power Company, increased its fares on May 15 with the approval of the Public Service Commission of New Hampshire. Where 5 cents has been charged heretofore 6 cents is now being charged and where 7 cents was charged heretofore 8 cents is now being charged. No other changes have been made. School children's tickets are being sold at the same price and on the same conditions as heretofore, namely, twenty-five tickets for $1 or six tickets for 25 cents.

Staggered Hours at Fort Worth—Owing to the recent eight-hour decision of the national arbitration board in the packing-house cases, the closing hour at Fort Worth has been 3 p.m. instead of 5 p.m. since May 4. This makes it possible for the Northern Texas Traction Company to handle the afternoon rush business from this source in time to use the same cars elsewhere for the store and office peak. Although the general direction of travel is opposite in direction, the packers moving inbound, the change in hours has brought notable relief to the company at a period of the day during which its facilities are sorely taxed.

Alton Would Charge Seven Cents.—A petition has been filed with the Public Utilities Commission of Illinois by the Alton, Granite & St. Louis Traction Company asking permission to raise fares in Alton from 5 cents to 7 cents, beginning July 1. An additional cent for each transfer also is proposed. Under the proposed schedule the round-trip rate between Alton and St. Louis would be the same as now, but a raise is asked for a single fare. Increases are asked for the monthly commutation books and the $4 books. Increases in the price of commutation books between Alton and East Alton and Wood River are proposed.

Straight Five-Cent Fare for Lynchburg.—The State Corporation Commission of Virginia has authorized the Lynchburg Traction & Light Company, Lynchburg, Va., to discontinue the sale of six tickets for 25 cents and 3⅓-cent school tickets and to charge a straight 5-cent fare. Application for this permission was made to the commission in December last. The case was heard on Feb. 26, was continued and further heard and argued on April 11. Unused tickets are to be redeemed at the price paid for them upon presentation at the office of the company on or after the date on which the new fare tariff goes into effect.

Maryland Road Files New Rates.—The Cumberland & Westernport Electric Railway, Cumberland, Md., on May 30 announced a new schedule of rates of fares which will go into effect on July 1. The change of passenger fares adds 1 cent per zone for each zone of the system above the rate of 5 cents now in force. Instead of paying 55 cents to ride from Cumberland to Westernport an additional 4 cents will be collected. From Cumberland to Frostburg the increase will be 3 cents, etc. The fare from Cumberland to Narrows Park remains the same. The clergy reduced-fare ticket book is increased 50 cents for 100 tickets, but miners riding on regular miners' cars will still be carried at 5 cents per zone.

Zone Fares Increased in Maine.—The Public Utilities Commission of Maine has handed down a decision increasing the zone fares on the Lewiston, Augusta & Waterville Street Railway from 5 cents to 7 cents, the zone boundaries remaining as heretofore. The decision involves 165 miles of track and some twelve cities and towns. On the very few zones on which more than a 5-cent fare had previously been charged, a proportional increase was granted. During its effort to secure higher fares the company carried on an extended publicity campaign to prove the necessity of the increase asked. This campaign was conducted by W. W. Harris, who is associated with Ivy L. Lee in the firm of Lee, Harris & Lee, New York.

I. U. T. Fare Increase Allowed.—The Public Service Commission of Indiana on May 27 issued an order authorizing the Union Traction Company of Indiana to increase its interurban passenger rates from 2 cents to 2½

cents a mile, effective on June 3. Ten cents is established as the minimum fare for a single passenger. The unit of computation is a zone of four-tenths of a mile at 1 cent a unit. This is in keeping with the "penny zone" plan established some time ago. The order will continue as a war emergency measure during the pleasure of the commission, and is intended to maintain the efficient operation of the company, but not to produce sufficient revenue for the payment of any dividends.

Women Only in an Emergency.—The Pacific Electric Railway, Los Angeles, Cal., has stated its attitude with respect to the use of women in train service on its lines. The company says: "There has been considerable discussion as to the employment of women in train and car service, and other departments as well, if the need for help on the electric railways, street and interurban, becomes such as to make their employment imperative. It is possible that the draft needs of the country for army and other war purposes, will bring about a condition where women will have to take up the work ordinarily done by men. If such a condition should arise in Los Angeles the Pacific Electric will give preference in such employment first, to eligible members of families and dependent relatives of the men who have gone to the front, and, second, to family relatives of Pacific Electric employees in active service."

Skip Stop Proposed for Kansas City.—The special committee of the City Council of Kansas City, Mo., to which the skip-stop matter was recently referred, held a recent hearing on the subject at which P. J. Kealy, president of the Kansas City Railways, and Robert B. Woods, city member of the Board of Control, explained the reason for the plan and its advantages. The committee expressed itself in favor of a skip-stop plan, but some of the Aldermen requested protection as far as possible for merchants at the corners where the operation of the plan might reduce traffic. President Kealy said that skip-stop operation would save 15,000 to 18,000 tons of coal a year in Kansas City, and that when the matter finally came up in the form of an ordinance, the fuel administration would probably send a man to urge its adoption. The committee ordered the preparation of an ordinance for the introduction of the skip-stop plan.

Final Argument in Trenton Service Case on June 11.—The cross-examination of H. C. Eddy, chief traffic inspector of the Board of Public Utility Commissioners, and of F. T. Daly, an assistant inspector, was completed on May 27 in connection with the application of the city of Trenton for improved service by the Trenton & Mercer County Traction Corporation. It was agreed that the case should come up on final argument on June 11. George L. Record, special counsel for the city, said he wanted to argue the case orally and Frank S. Katzenbach, for the company, said that if Mr. Record wanted an oral argument, his side was willing. One of the principal points brought out by the company was that the cost of trackage had increased 50 per cent over normal times. Another point was made by Mr. Katzenbach in having Mr. Eddy admit that from a financial angle this was not a very good time to make any radical changes.

Trenton Fare Case Opened.—In testimony before the Board of Public Utility Commissioners of New Jersey on June 3, on the application of the Trenton & Mercer County Traction Corporation for the abolition of six-for-a-quarter tickets and for a 6-cent fare, Rankin Johnson, president of the company, stated that if the increase was granted the company could provide for an increase in the wages of its employees amounting to $20,000 a year and also for a $500,000 expenditure for a plant addition as well as $25,000 for increased depreciation fund. He was still on the stand when adjournment was taken until June 13. It was stated that two days, that day and the next, would be required to complete Mr. Johnson's testimony. A date will then be fixed for the cross-examination by Charles E. Bird, city counsel and George L. Record, special counsel, for the city, and by Martin P. Devlin, representing the labor unions. Frank S. Katzenbach and Edward M. Hunt, represent the company.

New York's Owls May Go.—On June 4 it was announced that John Candler Cobb, Boston, a director of the New York (N. Y.) Railways, had been appointed by the board to investigate and report on the amount and nature of the service which the company can and should give the public under existing conditions. Mr. Cobb said that while he was not prepared to state what the results of the work would be, he could say that his preliminary study indicated that a shutdown of night service would probably enable the company to solve the problem. He said that he wanted everyone engaged in any essential industry that would be seriously interfered with by stopping transportation between 10 p.m. and 6 a.m. to communicate with him at the office of the company. Members of the Public Service Commission commented sarcastically on the proposal to suspend night service by stating that New York was not Boston and that it was a twenty-four hour city. The suggestion of Mr. Cobb was quickly turned to their advantage by the daily newspaper columnists.

From Eight Zones to Seven Zones.—At its regular meeting on May 22 the Railroad Commission of South Carolina granted a postponement of the date upon which the change in passenger fares upon the Augusta-Aiken Railway will become effective. The date for the change from the 40-cent to the 35-cent rate was originally set for June 1. It was changed on May 22 to June 8, in order to comply with the laws requiring thirty days' notice for such changes in rates. The commission has virtually agreed upon the new seven-zone system upon this road, which it is believed will remove all causes for complaint in regard to passenger fares. This move by the commission is undoubtedly made in accordance with its announced purpose to reserve to itself the right to rearrange the zones to meet the demands of travel as they showed themselves during the trial period of three months. The decision in this case was reviewed in the ELECTRIC RAILWAY JOURNAL of April 13, page 726. Eight 5-cent zones have been in effect.

Fare Increase in Oshkosh.—The Railroad Commission of Wisconsin has rendered its decision in the application of the Eastern Wisconsin Electric Company to shorten several of its routes in the city of Oshkosh, and to discontinue the sale of the eight-for-a-quarter workmen's tickets. The decision of the commission, while it authorized the elimination of the eight-for-a-quarter tickets, required the substitution of twenty-five tickets for $1 or twelve tickets for 50 cents, to be good during a certain period in the morning and at night. The shortening of the routes was also authorized as a means of giving a more dependable service, and the application of the company for permission to adopt one-man operation in the city of Oshkosh was also granted. The company has made application to discontinue the operation of its local cars in the city of Neenah, Wis., and has also made application for authority to increase the railway fare between Fond du Lac and North Fond du Lac from 5 cents to 6 cents from 6 a.m. to 12 midnight and from 5 cents to 10 cents from 12 midnight to 6 a.m.

One-Man Cars and Charge for Transfers.—A petition has been filed with the State Public Utilities Commission by the Utah Light & Traction Company, Salt Lake City, Utah, for an order permitting it to use but one operator to perform the duties of motorman and conductor on a car outside of the congested district and to issue only limited or directional transfers, charging 1 cent apiece for them. In its petition the company sets forth that the order is necessary to reduce expenses to meet the new wage schedule of 40 cents an hour paid to employees. On Jan. 1 the company discontinued selling strip tickets at 4 cents each. This was on order of the commission. The city carried this case to the court. Only recently the Supreme Court upheld the commission order. Then came an increase in pay to the men as a result of arbitration, noted in the ELECTRIC RAILWAY JOURNAL of May 25, page 1023. This finding was not without its compensating feature for the company, however, as the board of arbitration urged upon the commission such action as would give prompt and speedy relief to the company through an increase of rates. June 11 has been set for a hearing on the application of the company to charge for transfers.

Personal Mention

J. L. Burkholder has been named general agent of the Illinois Traction System at Decatur, Ill.

F. H. Williams has succeeded H. C. Howard as publicity agent of the Winnipeg (Man.) Electric Railway.

M. A. Tupton has been appointed superintendent of the Shore Line Electric Railway, Western division, which includes New London, Niantic, Chester, Old Saybrook to New Haven.

Harry Hoyt, acting superintendent of the Shore Line Electric Railway, Western division, will become superintendent of the Eastern division, embracing the lines in Norwich, Groton, Stonington, Watch Hill and Weekapaug with headquarters at Westerly.

M. H. Frank has been appointed manager of the Eastern Wisconsin Electric Company at Fond du Lac. Prior to this appointment Mr. Frank was operating engineer of the Galesburg Railway, Lighting & Power Company of Galesburg, Ill., and previous to that time was assistant engineer on the Indiana & Michigan Electric Company at South Bend, Ind.

C. E. Warwick, superintendent of the Vicksburg Light & Traction Company, Vicksburg, Miss., has been appointed railway superintendent of the Eastern Wisconsin Electric Company at Sheboygan, Wis., and has assumed his new duties. Mr. Warwick was connected with the Vicksburg property from August, 1914. Prior to that he was superintendent of the city division of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.

E. F. Greenleaf, of the Orleans-Kenner Traction Company, New Orleans, La., has been made general superintendent. Mr. Greenleaf moved to Louisiana twenty-five years ago and located in Gretna. He then joined the J. W. Thompson Sand & Gravel Company, working at Profit Island, and later went with the Midland Bridge Company and constructed many railroad bridges in the State. He started with the Orleans-Kenner line several years ago and was promoted from agent to general agent. He also was largely responsible for building up Felix Park, which is owned and operated by the company.

H. C. Young, who recently was appointed purchasing agent of the International Railway, Buffalo, N. Y., succeeding the late J. C. Sheldon, was by this appointment transferred from the department of bridges and buildings, of which he had been superintendent for five years. Previous to this he was for two years chief engineer of the track department and still earlier he spent four years in the engineering department of the Chicago City Railway. Mr. Young entered the electric railway business from the steam railroad field in which he was engaged on engineering work for about six years. His technical work involved a great deal of contact with the problems connected with the purchase of materials and equipment, and thus furnished admirable training for the varied duties of the purchasing agent of a large railway system.

C. E. Fahrney, newly-elected president of the Iowa Electric Railway Association, has been connected with the railway property at Ottumwa, Iowa, now operated by the Ottumwa Railway & Light Company, for the past twenty-three years, during which time the company has been reorganized and has changed hands several times. Upon graduation from the local high school, he entered the employ of the Ottumwa



C. E. FAHRNEY

Electric Railway as storekeeper in 1895. In 1896 this company was placed in the hands of a receiver and he was transferred to the office force, becoming superintendent of transportation in 1896. In 1905 the property was taken under the management of H. M. Byllesby & Company. Mr. Fahrney was made general manager in 1911, which position he still holds. Mr. Fahrney has been vice-president of the Iowa Electric Railway Association for the last two years.

Obituary

W. H. Carnahan, assistant treasurer of the Illinois Traction System, died at his home in Champaign, Ill., on May 17 last. Mr. Carnahan was born in Cincinnati, Ohio, on Sept. 27, 1853, and resided there until 1872, when he removed to Kansas City, Mo. Later he moved to Monticello, Ill. In 1880 he became associated with the firm of J. B. & W. B. McKinley, dealing in Western land, and for several years was located in the State of Nebraska. When W. B. McKinley launched his public utility plans in Illinois which resulted in the organization of the electric railways in that State into the system known as the McKinley lines, Mr. Carnahan returned to Champaign, Ill., and associated himself with the Illinois Traction System as assistant treasurer. This position he held up to the time of his death. He is survived by the widow and seven children.

D. Hayward Ackerson, manager of sales of the Cincinnati Car Company, Cincinnati, Ohio, until January, 1918, when he was commissioned a first lieutenant in the Ordnance Department, died recently following an operation for appendicitis. Mr. Ackerson started to work for the company in the summer of 1905 as an apprentice in the shops, returning in the fall to school. He followed this arrangement until 1909, when he was graduated from the University of Cincinnati. He then entered the car wiring department of the Cincinnati Traction Company. Later he became a draftsman in the office of the master mechanic. In the spring of 1910 Mr. Ackerson entered the service of the Westinghouse Electric & Manufacturing Company, but on May 1, 1914, he resigned from that company to become manager of sales with the Cincinnati Car Company. Mr. Ackerson was only twenty-nine years old.

Capt. Harry A. Bullock, secretary of the New York Municipal Railway Corporation, head of many committees of the Brooklyn (N. Y.) Rapid Transit Company organization, and more recently assistant divisional quartermaster with the United States Army in France, was killed by an aerial bomb on Decoration Day while on duty at division headquarters about 5 miles back from the first line trenches where, on a certain sector, American troops were standing off the German offensive. Capt. Bullock was born in Northampton, Mass, thirty-nine years ago. He was graduated from Amherst College in 1899. He entered the newspaper business shortly afterward, and after working for several years as a reporter on New Haven and Boston newspapers came to New York to join the staff of the New York *Times*. In addition to being secretary of the New York Municipal Railway Corporation, Captain Bullock was in charge of all of the welfare activities of the Brooklyn Rapid Transit Company, and he brought to his tasks not only great talent as an organizer and as a thorough and capable investigator, but great enthusiasm and energy. Before the country became involved in the war he felt that it was his duty to become prepared for assisting it in case of necessity, and took the preliminary training at Plattsburg. Mr. Bullock was a member of the committee on education of the American Electric Railway Association.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

Recent Incorporation

*Mount Vernon & Camp Humphries Railway, Mount Vernon, Va.—Incorporated to construct a line from Mount Vernon to Camp Humphries. Capital stock, $50,000. Officers: James R. Caton, president, and John G. Graham, secretary and treasurer, both of Alexandria, Va.

Franchises

Erie, Pa.—A temporary certificate of public convenience has been issued by the Public Service Commission granting the Buffalo & Lake Erie Traction Company permission to construct a loop around East Perry Square, to remain during the period of the war and for six months after its conclusion.

Track and Roadway

Anniston, Ala.—A corporation has been organized with capital stock of $200,000 to construct an electric railway from Anniston to Camp McClellan. The following were elected officers of the company: W. H. McKleroy, president; Dr. J. L. Wikle, vice-president, W. H. Weatherly, treasurer, and L. L. Crump, secretary. As soon as the War Department grants permission to enter the reservation, work on the line is expected to begin. James Mitchell, president of the Alabama Power Company, announced that he would take $50,000 of the stock for his company and offered the use of the company's Noble, Tenth, Moore and Thirteenth Street loops to the new car line. [May 25, 1918.]

Pacific Electric Railway, Los Angeles, Cal.—Work will soon be begun by the Pacific Electric Railway on the reconstruction of its tracks on Franklin Avenue, Hollywood.

Evansville, Ind.—The Public Utilities Company has received permission from the Board of Public Works to extend its Fulton Avenue line from Gavitt Street to a point 150 ft. north of Twenty-eighth Street, where the company will establish a loop in place of the one now on Gavitt Street.

International Railway, Buffalo, N. Y.—Plans are being made by the International Railway for the construction of 8.7 miles of new track in Buffalo this year, to cost approximately $870,000

Toronto (Ont.) Civic Railway.—Work of laying rails on the Bloor Street viaduct will be proceeded with at once, according to a decision recently reached by the Ontario Railway & Municipal Board. Girder rails now on hand are to be used for this purpose and T-rails will be used temporarily to complete the work. Meanwhile the Pape Avenue line of the Toronto Railway will have to remain undone until more rails are secured.

Sandwich, Windsor & Amherstburg Railway, Windsor, Ont.—This company contemplates the construction of a loop on Ferry Avenue and the construction of double tracks on London Street and Ouellette Avenue. The company will also install double curves at the intersection of Ouellette Avenue and Sandwich Street.

Hull (Que.) Electric Company.—The Hull Electric Company will construct an extension to its lines.

Levis County Railway, Levis, Que.—This company reports that it plans to reconstruct its track and ballast the roadbed at a cost of approximately $100,000.

Dallas (Tex.) Railway.—The work of placing new curves and double tracking the electric railway lines at Commerce and Lamar Streets by the Dallas Railway has been finished and as soon as new schedules are arranged and approved by M. N. Baker, Supervisor of Public Utilities, the Oak Cliff cars will be routed as crosstown lines. The cars will cross from Commerce to Elm on Lamar, and will then be routed out Elm Street and Bryan to Munger Place. The City Commission of Dallas, Tex., has awarded the contract for paving of Jefferson Street from Commerce to Young Streets and has issued an order to the company to pave the portion of the street under and between its tracks. The company's share will amount to about $2,663.

Wheeling (W. Va.) Traction Company.—Work has been begun by the Wheeling Traction Company on the rehabilitation of its lines.

Shops and Buildings

Pacific Electric Railway, Los Angeles, Cal.—Contracts have been awarded by the Pacific Electric Railway to the Wurster Construction Company, Los Angeles, for the construction of its new shops at Torrance, as follows: Car works, 180 ft. x 400 ft.; heavy machine shop, 180 ft. x 450 ft.; forge shop, 150 ft. x 200 ft.; erecting shops, 180 ft. x 450 ft.; paint shop, 180 ft. x 450 ft.; power plant, about 60 ft. x 120 ft., and other structures. The cost of the entire work is estimated at $1,000,000.

Interborough Rapid Transit Company, New York, N. Y.—A new station is being built by the Interborough Rapid Transit Company at 162d Street and Anderson Avenue, The Bronx. The station will consist of a two-story building about 75 ft. x 80 ft., the large central portion being devoted to station purposes, on each side of which will be a good-sized store, capable of being divided into two smaller stores. The building will be fireproof throughout, with ornamental front in harmony with the neighboring buildings.

Montgomery Transit Company, Norristown, Pa.—This company reports that it has under construction a new repair shop at Skippack.

Texas Electric Railway, Dallas, Tex.—A new passenger station and car repair shop will be built by the Texas Electric Railway at Denison, to cost about $10,000.

Power Houses and Substations

Pacific Electric Railway, Los Angeles, Cal.—Plans have been prepared by the Pacific Electric Railway for building a one-story brick substation, about 32 ft. x 50 ft., at Slauson Junction, Slauson and Long Beach Avenues.

Potomac Electric Power Company, Washington, D. C.—Owing to the erection of many additional government buildings in Washington and the establishment around that city of many camps and cantonments, the Potomac Electric Power Company, which is controlled by the Washington Railway & Electric Company, has made a number of extensions to its power system. At the station it installed a 15,000-kw. unit in January, 1917, and has placed an order for another of the same size which is promised for delivery Jan. 5, 1918, and is negotiating for a third generator of the same size. Boiler equipment for this additional power is also being installed. Additional substation equipment has also been purchased, and the company is negotiating with the government to supply steam heat for new buildings near its station.

Manila Electric Railway & Light Company, Manila, P. I.—A report from the Manila Electric Railway & Light Company states that the company plans to construct an extension to its present power plant. The company has recently purchased one 5000-kw. turbine and 10,000 sq.ft. condenser, one 1000-kw. rotary, one 100-kw. M. G. exciter, switchboard, etc., from the Westinghouse Electric & Manufacturing Company and six 6-retort Taylor stokers. The company will soon purchase an economizer and induced-draft fans.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—Work will be begun at once by Stone & Webster on the construction of a concrete power station at 6500 Fourteenth Avenue South, Seattle, to cost about $30,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Standardizing Catalogs Along Practical Lines

Conference in Chicago Recommends Regular Page Sizes, Weights and Colors of Paper

Following the appointment of a committee on the standardization of catalogs of the National Association of Purchasing Agents, by E. L. McGrew, purchasing agent of the Standard Underground Cable Company of Pittsburgh, Pa., much correspondence was carried on with all the associations in the various lines of catalog preparation and distribution. As a result a conference was held by the committee at the Hotel La Salle, Chicago, Ill., on May 22. Representatives from a number of organizations interested, including the American Institute of Architects, American Association of Heating & Ventilating Engineers, American Association of Mechanical Engineers, National Gas Engine Association, Steel Furniture Manufacturers' Association, American Supply & Machinery Manufacturers, Electrical Manufacturers' Council, catalog manufacturers, representatives from firms engaged in industrial lines using catalogs for the dissemination of information relative to their products, as well as from the National Association of Purchasing Agents.

After addresses were delivered by representatives from all the organizations, some of which had already adopted a standard size or sizes of catalogs, used by their own trades, the conference adopted resolutions in effect as follows: three sizes of catalog pages, namely—6 in. x 9 in., 7½ in. x 10⅝ in. and 8 in. x 11 in. Sizes of book papers—25 in. x 38 in., 32 in. x 44 in. and 33 in. x 46 in. Standard weights of book papers, based on the 25-in. x 38-in. size—40 lb., 45 lb., 50 lb., 60 lb., 70 lb., and 80 lb. Colors of paper—white and natural.

During the evening the standardization of catalogs committee of the National Association of Purchasing Agents held its session, at which it adopted as the standard size for catalogs which will be furnished to purchasing agents, pages measuring 7⅛ in. x 10⅝ in. These dimensions are of the oblong proportions, which will cut with least waste from the standard 32-in. x 44-in. sheet of paper.

The purchasing agents have, therefore, adopted one standard size of catalog, which is of such proportions that in case it might be found desirable to furnish smaller editions to other trades they could be reproduced from the original wash drawings instead of requiring new ones to be made.

Catalogs are designed to sell goods, it was declared, but are now seldom used for that purpose, on account of their inaccessibility. Therefore the purchasing agents are preparing to issue posters which will advertise the fact that they are backing as a unit the 7½-in. x 10⅝-in. page size, bound in sectional form; and are urging the co-operation of all manufacturers in bringing about this standardization.

Future of Steel Extremely Uncertain

New Freight Rates Likely to Increase Prices—Supply Difficult to Estimate

With the government now taking over 100 per cent of the steel output, and normally at least 80 per cent, manufacturers of electric railway equipment and supplies view the future with considerable apprehension. It is known that a nmber of firms, anticipating their wants, have at least a year's stock of sheet steel. While congratulating themselves on being so fortunate, they say a year, at the best, is only a short time. Before its expiration further requirements must be provided.

The acuteness of the steel supply is further emphasized by a notice to the mills on Monday from the War Industries Board. The board requests manufacturers to furnish the names of all customers, the orders they seek to place, the orders accepted by the companies, and the commodities for which the steel is to be used. Previously the board required a record of all orders taken and shipments made, but the names of individual buyers were not asked. It is further expected that a stricter application of priority rules, to an extent which will mean that all the steel and iron produced by the plants will be at the direction of the government. In fact, on Thursday the government assumes absolute control of the distribution of all manufactured steel products and pig iron.

Another disturbing factor is new freight rates, an advance of 25 per cent, which goes into effect on June 25. This increase will be used by iron and steel makers as an argument that the War Industries Board should not reduce the price of their products for the period after June 30, when the present schedule expires by limitation. On finished goods sold to commercial users the buyer will pay the increased rates. This, of course, swells the costs of the manufacturers of the long list of traction road and power house equipment and accessories. It is this phase of the question which is causing the most concern.

Higher Prices Put on Power Plant Apparatus

Motors, Switchboards, Turbines, Transformers and Generators Are Marked Up 10 Per Cent

Within the past ten days numerous announcements of advances in power-plant equipment have come out from the manufacturers. A general advance of 10 per cent on motors was made in the neighborhood of June 1. One of the leading manufacturing concerns sent the following notice to its agents:

"Effective Saturday noon, May 18, advance net selling price 10 per cent on all lines covered by apparatus, switchboard, turbine and motor price book sheets dated prior to May 16, pending receipt of revised price sheets or discounts."

Another company of prominence made the switchboard advance about the middle of May; but on motors of all sizes, alternating and direct current; transformers, generators and motor-generator sets its new prices went into effect on June 3. Transformers, electric locomotives and some other specialties were made exceptions under the new ruling by the first-named concern.

It is held by the various manufacturers that a steady advance in the cost of material has rendered the increase in finished goods imperative. Further, it is also the opinion of several large producers who adjust their operations strictly on market and general conditions that a mark-up in a couple of months on all lines of electrical supplies should be no cause for special astonishment. The manufacturing situation, for obvious reasons, has been getting more acute within the last few months. It is safe to say, according to authorized statements, that with the still further anticipated scarcity and difficulty of obtaining material, shortage of skilled labor and other drastic contingencies, conditions are speculative and far from stable or certain. Therefore it is hard to tell what may occur.

With possibly one exception, the manufacturers have a standing rule of "price subject to change without notice," applicable to current buying and ordering. This concern stipulates that a leeway of fifteen days be allowed on all acceptance orders. That is to say, when a quotation is submitted the clause provides that it is good for the period designated, no matter if another price be announced in the meantime. For a while this clause was more or less loosely construed, but recently the trade was notified that it would be strictly enforced.

Government Orders Freight Bills Paid in Cash

Regulation Effective July 1—Credit Accommodations Canceled—Modification Sought by Large Shippers

In general order No. 25 the Director General of Railroads places the collections of freight charges practically on a cash basis. The essential parts of the order follow:

Effective July 1, 1918, the collection of transportation charges, by carriers under federal control, for services rendered, shall be on a cash basis, and effective as of that date; credit accommodations then in existence which may be in conflict with the following regulations shall be canceled.

In cases where the enforcement of this rule with respect to freight will retard prompt forwarding or delivery of the freight or the prompt release of equipment or station facilities, carriers will be permitted to extend credit for a period of not exceeding forty-eight hours after receipt for shipment of a consignment if it be prepaid, or after delivery at destination if it be a collect consignment; provided the consignor, if it be prepaid consignment, or the consignee, if it be collect, file a surety bond either individual or corporate, in an amount satisfactory to the treasurer of the carrier. The form of such bond shall be prescribed by the chief legal office of the individual carrier, conditioned upon and providing for payment of all charges within forty-eight hours after forwarding or delivery of the freight. Upon receipt and acceptance of such bond a carrier may accept and forward prepaid consignments or may deliver collect consignments in advance of payment of all charges thereon to the amount covered by the bond. Failure to pay such charges within the time prescribed will automatically cancel such credit.

Freight consigned to order or to "order notify" shall be delivered only upon surrender to the agent of the carrier of the original bills of lading for such freight, and the payment of the freight charges thereon as herein provided. Provided, however, if such bill of lading be lost or delayed the freight may be delivered in advance of surrender of the bill of lading upon receipt by the carrier's agent of a certified check for an amount equal to 110 per cent of the invoice, or upon receipt of a surety bond either individual or corporate, acceptable to the treasurer of the carrier in an amount for twice the amount of invoice.

A representative committee of traffic managers of large shipping interests in the important industrial centers was in conference with the Railroad Commission in Washington last week with a view to securing a modification of the order. The shippers contended a reasonable time should be allowed for checking and auditing freight bills as to their correctness.

Atlantic Welding Reorganization and Change of Name

Interests controlling the Lincoln Bonding Company of Cleveland have acquired the controlling interest of the Atlantic Welding Company of New York, which company possesses valuable welding and rail-joint patents, including the basic Gailor patents covering the joint structures familiarly known among railway companies.

A contract has been entered into with the Lincoln Bonding Company, which has always manufactured the generators for the Atlantic Welding Company and has always had the same agents as the Atlantic Company, whereby the entire promotion of sales including the soliciting of new royalty contracts and maintenance of all present contracts, will be handled exclusively by the Lincoln Bonding Company.

In order to more closely associate the work of the two companies, the name of the Atlantic Welding Company has been changed to the Lincoln Rail Welding Company. For similar reasons, and to insure better service to the welding company's customers, the manufacturing facilities of the Atlantic Welding Company will be consolidated with those of the Lincoln Bonding Company at Cleveland, and all products will be marketed under the name of the Cleveland company. The New York office will be maintained, but only as a district office.

As the two companies have always had the same agents in the various territories no effect will be noticed by the customers of either company.

Priority of Orders in Allocation of Steel

How Electric Railway Equipment Manufacturers Must Make Application for Requirements

The market situation of iron and steel, and why manufacturers of electric railway cars, general equipment and accessories are speculating on their future supply, are of more than passing importance. Among other matters relating to this much discussed subject is the allotment or allocation of steel and steel products after the requirements of the government and its war allies are filled. The plan is still under discussion by the War Industries Board; but the appended notification, recently furnished by the Priorities Committee, describes what applications—which must be made out on an official form supplied—will be considered and how certificates will be granted:

"Allocation of steel is undertaken by the director of steel supply only with reference to orders placed directly by the government. As to orders not placed directly by the government, when a concern desires steel and cannot place its orders without first receiving a priority certificate a certificate may, on proper showing, be granted. Before making an application the applicant must determine whether the steel company will accept the order if priority is granted, insomuch as the certificate is not designed to compel the steel company to accept the order. In other words, the concern desiring steel should go to its regular source of supply and place its order, subject to the obtaining of priority. If the steel company signifies its willingness to accept the order, if priority is granted, then an application covering the tentative order may be made and will be considered by this committee. Of course, if an order has actually been accepted, priority may be granted thereon, the rating in each case being entirely dependent on the actual need of the steel covered for war work or other work of exceptional importance.

"Save in very exceptional cases, no priority is granted for the replacement or maintenance of stock. Where, however, it is clearly shown that an urgent need exists for the maintenance of the particular stock for use in war work or other work of exceptional importance, priority is sometimes granted. An affidavit and personal guaranty that the material will be used solely for such purposes must be incorporated in the application, and the precise intended use of the materials required must be stated in detail. The application must cover specific orders, as a blanket certificate will not be issued."

Rolling Stock

Boston (Mass.) Elevated Railway has been authorized by the Public Service Commission to purchase 200 center-entrance cars and 100 trailers, referred to last week and in previous numbers of the ELECTRIC RAILWAY JOURNAL. The center-entrance or motor cars are to cost approximately $12,000 and the trailers $5,000 each. It is reported the cars will not be delivered for several months, owing to the heavy demands on the car manufacturing companies.

North Coast Power Company, Vancouver, Wash., is reported as having bought one new one-man car, of the latest type, from the American Car Company, St. Louis, Mo. It is now in service on the Orchard-Sifton line.

Brooklyn (N. Y.) Rapid Transit Company in placing its order for fifty center-entrance trail cars, referred to in the ELECTRIC RAILWAY JOURNAL of May 11, with the Jewett Car Company, Newark, Ohio, supplies the following specifications:

Number of cars ordered	50
Name of road	Brooklyn Rapid Transit Co.
Date order was placed	May 11,1918
Builder of car body	Jewett Car Co.
Type of car	Trailer, semi-convertible, center-entrance, surface passenger
Seating capacity	61
Weight (total)	Approximately 28,000 lb.
Bolster centers, length	24 ft. 8 in.
Length over bumpers	45 ft. 6 in.
Width over all	8 ft. 6 in.
Height, rail to roof	11 ft. 3 in.
Body	Semi-steel
Interior trim	Wood and metal
Headlining	Agasote
Roof, arch or monitor	Monitor
Air brakes	Westinghouse
Axles	Carnegie
Couplers	Westinghouse
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Designation signs	Electric Service Supplies Co.
Door operating mechanism	Consolidated Car Heating Co.
Fare boxes	Vogelsong
Fenders or wheelguards	H-B wheelguards
Hand brakes	Peacock improved
Heaters	Gold Car Heating Co.
Headlights	Dayton No. 1583
Journal boxes	Brill
Registers	International
Sash fixtures	Edwards
Seats, style	H. B. & W. reversible cross and longitudinal
Seating material	Wood
Trucks, type	Brill trailer trucks
Ventilators	Monitor deck type
Wheels (type and size)	22-in.

Seattle (Wash) Municipal Street Railway, by an ordinance recently introduced in the City Council is authorized, through the Board of Public Works,

to prepare specifications and advertise for bids for the purchase of six one-man single-truck cars and twenty double-truck cars, for the equipment of the Municipal Elevated Railway now under construction. A bill was also passed providing for the improvement of the Loyal division of the Municipal Railway at a cost of not more than $2500.

Perley A. Thomas Car Works, High Point, N. C., will be the builder of the four steel cars for the Southern Public Utilities Company, mentioned in this department two weeks ago, and not the Southern Car Company. The Perley Thomas company has succeeded to the business and plant of the Southern Car Company.

General Electric Company, Schenectady, N. Y., has received a contract from the city of San Francisco for six 4-ton storage-battery locomotives which will be used in the tunnels being driven on the Hetch Hetchy water supply project. One of these locomotives will be operated in each of six portals, and a charging station will be installed at each of these portals. The contract price was $6,527 each, or a total of $39,162.

Trade Notes

John F. Godfrey, manufacturer of coal handling conveyors, has moved his plant from Elkhart, Ind., to Chicago, Ill.

Moloney Electric Company, St. Louis, Mo., announces that J. Van Buskirk, formerly associated with the Minerallac Company, Chicago, Ill., has just been appointed manager of the Chicago office.

General Electrical Company, Chicago, Ill., has lately opened a large branch with offices and a traveling force in Memphis, Tenn., in the Lotus Building, Jefferson Avenue, near Second Street, where the entire first floor is occupied.

George L. Kippenberger, formerly special sales agent of the St. Louis Car Company, has been appointed assistant to the vice-president. Among other numerous duties, he will give particular attention to the direction of all production activities.

Charles A. McCune has resigned his position as chief engineer of the Commercial Acetylene Company, to become sales engineer with the Page Steel & Wire Company, New York, where his efforts will be devoted to sales and service in connection with Armco welding rods.

McGuire-Cummings Manufacturing Company, Chicago, Ill., announce that William T. Twomey has been elected vice-president of that company. Mr. Twomey is well known in the electric railway field, having been connected with the Cummings interests for several years.

Horne Manufacturing Company, New York, supplied the staffless brakes on the thirty-two new cars of the Richmond Light & Railroad Company, one of which was illustrated and described in the last issue of this paper. The name of another manufacturer was mentioned in the article.

Jeffrey-Dewitt Insulator Company, the new corporate name of what was formerly the Jeffrey-Dewitt Company, manufacturer of the J-D high-tension suspension insulator, will be operating its new plant at Kenova, W. Va., on June 1. Its offices will be in the first National Bank Building, Huntington, W. Va.

New Advertising Literature

Autoscope Products Corporation, New York, N. Y.: Circular describing the Cruban solderless wire terminal.

General Electric Company, Schenectady, N. Y.: Bulletin No. 46,018A, describing and illustrating its type P-8 voltmeter, wattmeter and ammeter.

Laclede-Christy Clay Products Company, St. Louis, Mo.: Illustrated catalog, entitled "The Stoker for the Higher Volatile Coal," describing in detail the company's chain grate stoker.

Combustion Engineering Company, New York, N. Y.: Bulletin C1, describing its Coxe stokers. This booklet is profusely illustrated with actual installations and shows diagrams of several different kinds of boiler settings.

James G. Biddle, Philadelphia, Pa.: Engineering instruments are described in a bulletin that is now being distributed. Some of the instruments are meggers for testing electrical resistance of conductors or insulations, hand tachometers, vibrating reed tachometers, reed frequency meters, portable switchboard instruments and rheostats.

NEW YORK METAL MARKET PRICES

	May 29	June 5
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26½ to 26¾	26½ to 26¾
Lead, cents per lb	7 65	7.25
Nickel, cents per lb	40	40
Spelter, cents per lb	7½	7½
Tin, Chinese,* cents per lb	$1.00	.90
Aluminum, 98 to 99 per cent., cents per lb	†32.10	†33.00

* No Straits offering. † Government price in 50-ton lots or more, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	May 29	June 5
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	19
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6	5
Zinc, cents per lb	*12	5½
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$50.00	$60.00
Machine shop turnings, Chicago, net ton	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	May 29	June 5
Rubber-covered wire base, New York, cents per lb	27 to 34	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	30½ to 36.10	30½ to 30.40
Weatherproof wire (100 lb. lots), cents per lb., Chicago	38 00 to 38.35	35.43 to 38.00
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 100 to 500-ton lots, per gross ton	$67.50	$67.50
T-rails (A. S. C. E. Standard) 500-ton lots, per gross ton		$62.50
T-rails, high (Shanghai), cents per lb	4½	4½
Rails, girder (grooved), cents per lb	4½	4½
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3½	*3½
Tie plates (brace type), cents per lb	*3½	*3½
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3½	*3½
Angle plates, cents per lb	*3½	*3½
Angle bars, cents per lb	*3½	*3½
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	¶
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4 35	4 35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount†	80%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount	80%	80%
Car window glass (double strength, all sizes AA quality), New York discount	82 & 3%	82 & 3%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13¼	13 to 13¼
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.00
Asphalt filler, per ton	$45.00	$45.00
Cement (truck lots), New York, per bbl	$3.20	$3.20
Cement (carload lots), Chicago, per bbl	$3.26	$3.26
Cement (carload lots), Seattle, per bbl	$3.60	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.58	$1.58
White lead (100 lb. keg), New York, cents per lb	10	10½
Turpentine (bbl. lots), New York, cents per gal	53	52½

* Government price. † These prices are f.o.b. works, with boxing charges extra.

Peacock Brakes

are kept busy at New Orleans



On almost every hand brake car of the New Orleans Railway & Light Company, the Peacock Brake is the standard.

Bear in mind that it is not a standby brake, but the only brake.

A brake that must make good on crowded four-track Canal Street or on slippery rails in suburban high-speed running.

And this the Peacock does on some 400 cars in every character of operation.

The case of New Orleans is simply typical of the popularity of the Peacock Brake on scores of other big city systems.

Why not specify them for your new cars, leaving to us the problem of selecting the most effective and economical Peacock for your needs?

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ENGINEERS

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OPERATING AND RATE INVESTIGATIONS
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Analytical Studies of financial and operating conditions, appraisals and rate adjustments of electric railway and all public utility properties.

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Consulting Engineers

REPORTS APPRAISALS OPERATION

50 Church Street, New York

You are a faithful subscriber and reader of the Electric Railway Journal. You know how useful it is to you. Why not give us the names of those of your electric railway friends who would also benefit by being subscribers to the Electric Railway Journal? We will be glad to send specimen copies to any names and addresses that you mention.

ELECTRIC RAILWAY JOURNAL

THE P. EDW. WISCH SERVICE

Suite 1710 Park Row Bldg., New York — DETECTIVES — Suite 715 Board of Trade Bldg., Boston

ELECTRICAL TESTING LABORATORIES
Electrical, Photometrical and Mechanical Testing.
80th Street and East End Ave., New York, N. Y.

Scofield Engineering Co. Consulting Engineers
PHILADELPHIA, PA.
POWER STATIONS GAS WORKS
HYDRAULIC DEVELOPMENTS ELECTRIC RAILWAYS

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.



Northwestern Pacific R.R. installs

"Armco" Iron Culverts

The photograph shows how the "Northwestern" safeguards its roadbed in tough ground. This view was taken before the track was laid.

Soil conditions were exceptionally difficult on this construction. In many places it was impossible to secure stable foundations and on slopes the shifting and sliding subsoils made masonry construction out of the question.

"Armco" Iron Corrugated Culverts met this situation exactly. They stood up perfectly under conditions which would mean destruction to any other type.

"Armco" Iron is the purest and most even of irons, consequently it has the highest rust-resistance and the longest service life.

Write to the nearest Manufacturer for full information on Rust-Resisting "Armco"

AMERICAN ARMCO INGOT IRON

Resists Rust

Iron Culverts, Signs, Sheets, Roofing and Formed Products.

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California Cor. Culvert Co.

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R. Hardesty Mfg. Co.

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Delaware Metal Culvert Co.

Florida, Jacksonville
Dixie Culvert & Metal Co.

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Indiana, Crawfordsville
W. Q. O'Neall Co.

Iowa, Des Moines
Iowa Pure Iron Culvert Co.

Iowa, Independence
Independence Corrugated Culvert Co.

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The Road Supply & Metal Co.

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Kentucky Culvert Co.

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Dixie Culvert & Metal Co.

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Michigan, Bay City
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Minnesota, Minneapolis
Lyle Corrugated Culvert Co.

Minnesota, Lyle
Lyle Corrugated Culvert Co.

Missouri, Moberly
Corrugated Culvert Co.

Montana, Missoula
Montana Culvert & Flume Co.

Nebraska, Wahoo
Nebraska Culvert & Mfg. Co.

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Nevada Metal Mfg. Co.

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New Jersey, Flemington
Pennsylvania Metal Cul. Co.

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Northwestern Sheet & Iron Wks.

Ohio, Middleton
American Rolling Mill Co.
The Ohio Corrugated Culvert Co.

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Coast Culvert & Flume Co.

Pennsylvania, Warren
Pennsylvania Metal Cul. Co.

South Dakota, Sioux Falls
Sioux Falls Metal Culvert Co.

Tennessee, Nashville
Tennessee Metal Culvert Co.

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Western Metal Mfg. Co.

Texas, Houston
Lone Star Culvert Co.

Utah, Woods Cross
Utah Corrugated Culvert & Flume Co.

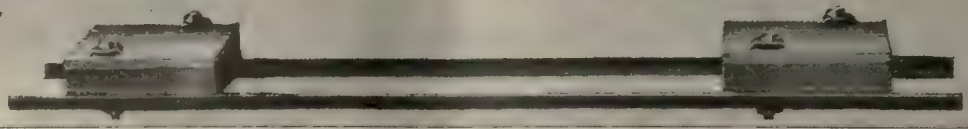
Virginia, Roanoke
Virginia Metal & Culvert Co.

Washington, Spokane
Spokane Culvert & Tank Co.

Wisconsin, Eau Claire
Bark River Bridge & Cul. Co.

Canada—Canada Ingot Iron Co., Ltd., Guelph Sherbrooke, Winnipeg, Calgary.

The MECHANICAL RAILWAY TIE



BETTER TRACKS
at Less Cost

Can Be Laid
by using
D.M. Ties all
the way!

Permanent—
Resilient—
Economical.



Are the Result
of careful
construction.

And the best and most careful method known so far is that of using D.M. Ties.

And these Ties have **Made Good** with a vengeance.

Dayton Mechanical Railway Ties are not only a **theoretical** solution of track troubles. They are the **practical** outcome of years of work and tests on track carrying both city and heavy, high-speed, interurban cars.

Write for full particulars.

THE DAYTON MECHANICAL TIE CO.
201 Third Street Arcade
DAYTON, OHIO

Save Money NOW by using

Reciprocating Track Grinders



IN OUR recent advertisements we have been endeavoring to show by reference to reliable statistics the economies which are produced by the use of RECIPROCATING GRINDERS when figures are considered over a period of years. The statistics we have cited show very clearly that this question of track grinding is from the standpoint of the whole electric railway industry a matter involving policies which may lead to economies of

Millions of Dollars Annually

IT IS no *small* matter. It is a very *big* one. There is, however, another viewpoint of importance. Regardless of questions of track economy; every day that "bad spots" are permitted to stay in the track means an added burden to the rolling stock maintenance account. Because bad track builds up that account to a considerable extent. This consideration cannot be figured out in dollars and cents and it certainly does not involve such sums as are involved in track cost and maintenance.

Nevertheless it is a mighty important item.

The reduction of it is one of the ways in which RECIPROCATING GRINDERS help to develop *immediate* savings.



Railway Track-work Company

30th and Walnut Streets, Philadelphia

AGENTS: Holden & White, Inc., 343 S. Dearborn St., Chicago.



Typical failure in solid casting at flangeway intersection in crossing.

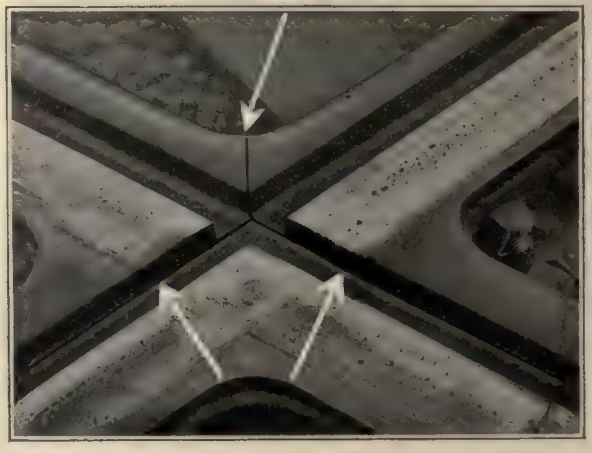
Plain Crossings

Note the Crack

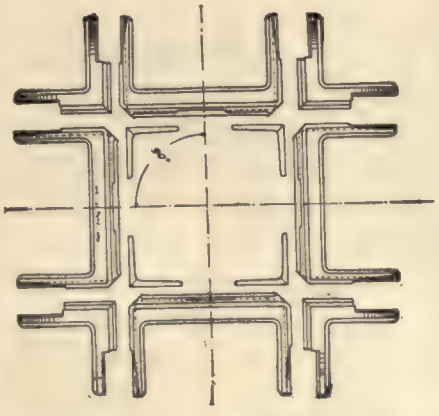
Your own experience with solid crossings tells you that fractures start where the photograph on the left shows. They are caused by lack of flexibility.

Balkwill Crossings

don't develop such cracks because scientifically designed joints are placed at the very spots where breaks formerly occurred.



Joints in Balkwill Articulated Cast Manganese Crossings are life savers. They positively prevent breakage at flangeway intersections, permitting 100% wear before renewal is necessary



Joints at the flangeway intersections of Balkwill Crossings positively eliminate breakage.

Cast manganese crossings having their flangeway intersections cast solid cost almost as much as BALKWILL ARTICULATED CAST MANGANESE CROSSINGS, but are frequently discarded due to breakage at the flangeway intersections when not more than 25% of their possible wear has been obtained. With the BALKWILL ARTICULATED CAST MANGANESE CROSSINGS it is possible to obtain 100% wear. Therefore, the BALKWILL Crossing actually gives you

MORE WEAR PER DOLLAR THAN ANY OTHER CROSSING YOU CAN BUY

Order Balkwill Crossings Direct from Your Special Work Manufacturers

Write for detail information and list of installations
Don't accept a so-called substitute, as there is none

The Balkwill Manganese Crossing Co.

506 Williamson Building, Cleveland, Ohio

THERMIT RAIL WELDING



SIMPLICITY

The simplicity of the Thermit apparatus used to weld rails enables you to undertake the welding of a small or a large number of joints with equal facility. The weld and reinforcement of Thermit steel fused around it insures an electrical conductivity equal to that of the rail itself; at the same time, the full strength of the rail is developed.

Write for Catalog today.

Metal & Thermit Corporation

120 Broadway, New York

Successors to
Goldschmidt & Detinning Co.
Goldschmidt & Thermit Co.

What the Engineers say

of the

Portable Electric Welder

"First in Value" "Most Useful"

"Greatest Labor Saver" "First in Importance"

in Reclamation

in Maintenance

Taking all in all it is my opinion that the electric welding machine has been the greatest labor saver in the track department. It saves materials as well as labor. Instead of renewing a frog, for instance, the points can be rebuilt by welding. Your second question is difficult for us to answer because conditions vary on our different properties. We think the welding machine comes first and a concrete mixer is considered generally a necessity and might come second, and the same is true of the power drill.

As you know I am not in close enough touch with actual operating conditions to reply in respect to the labor-saving features of the tools mentioned. In respect to their values in maintenance work, however, I would place the arc welder in connection with the grinding machine easily first in importance.

In answer to your request would state that the arc welding outfit to be the most useful apparatus. I should arrange in the following order the list given in question 2: Arc welder, crane car, power drill, air tamper, automatic dump car, electric shovel, concrete mixer, pavement plow, concrete breaker, acetylene cutting flame.

Answering question 1, I should put arc welders first. I should arrange the equipment in question 2 in the following manner: Arc welder, acetylene cutting flame, air tamper, crane car, concrete mixer, portable stone crusher.

Indianapolis Electric Welders, Simplex and Apex Welded Joints and Fluxated Welding Steel are used on 90% of the important electric railways of the country. They have been responsible for an annual saving of $2,000,000 since they were introduced in 1912.



Indianapolis Welders are cheap, for the first cost of the equipment is paid for inside of 60 days—and the operating-costs, including labor, current and steel, amount to only 1% to 2% of the value of the reclamation.

Indianapolis Switch & Frog Company

Springfield, Ohio



June 14th is Flag Day for All the Nation

Of course YOUR property will not ignore this stimulus to patriotic effort

SUGGESTED FLAG DAY PROGRAM

Prepared for celebrations at Industrial Plants to occupy part of the noon hour.

A committee of employers and employees, with foreign born men represented on committee, should be appointed to arrange details, secure bugler, singers, speaker, and colors.

1. Bugle Call Rally to Flag-Staff.
2. Flag Raising:

   As Flag rises, "The Star-Spangled Banner" should be sung either as solo or in unison.
3. Salute to the Flag:

   (To be given either as song, chant, or spoken words) "I pledge allegiance to my Flag, and to the Republic for which it stands. One nation indivisible with Liberty and Justice for all."
4. American's Creed

   (to be said in unison:)

   "I believe in the United States of America as a government of the people, by the people, for the people; whose just powers are derived from the consent of the governed; a democracy in a republic; a sovereign nation of many sovereign states; a perfect union, one and inseparable, established upon these principles of freedom, equality, justice and humanity for which American patriots sacrificed their lives and fortunes. I therefore believe it is my duty to my country to love it; to support its Constitution; to obey its laws; to respect its flag, and to defend it against all enemies."
5. Address by Four-Minute Man or other speaker.
6. Song—"America"

YOUR fellow-workers who are helping win this war by their toil at forge and bench will be spurred to further effort. They will realize more than ever that in this crisis they are working for the nation and the flag.

The foreign-born among them will be inspired to loyalty to this land which they have chosen for their home, while the native-born will be stimulated to more effective service.

A detailed program for the flag-raising ceremony is yours for the asking, and if you desire speakers, the Four-Minute Men and others are at your service.

Pin this Coupon to your letterhead and mail it now.

"Bureau of Education
Washington, D. C."

This space donated by

Publishers of Electric Railway Journal

through National Americanization Committee, Engineering Societies Bldg., New York City

Check your needs for Flag Day

Patriotic Posters

Program

Four-Minute Man

Number of employees.....

Firm.....

Address.....

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possess the durability and easy running qualities which inevitably result from specialized gearing knowledge applied in a plant specially equipped for the production of gearing only.

All Grade *Treated* and Grade *Hardened* Van Dorn gearing carries a Brinell test voucher.

Let us quote. Write Dept. E. R. J.

THE VAN DORN & DUTTON CO.

Gear Specialists

CLEVELAND, OHIO, U. S. A.

Offices: Boston, Chicago, Denver, Kansas City, New York, St. Louis, San Francisco, Toronto. New England Representative: Frank Ridlon Co., Boston, Mass.

If there is anything you want—

or something you don't want—that *other* readers of this paper can supply—or use—advertise it in the

Searchlight Section

NOW is the time to offer good second-hand machinery for sale. Demand exceeds production for immediate delivery of some equipment; that's why the market on used equipment is so good.

NOW—or any other time, use the Searchlight Section for advertising

Agencies Wanted
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Auction Notices
Buildings For Sale
Business Opportunities
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Contracts To Be Let
Contracts Wanted
Desk Room For Rent
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Machinery For Sale
Machinery Wanted
Educational Courses
Employment Agencies
Exchanges
Factory Buildings For Sale
For Rent Items
Franchises
Industrial Sites
Machine Shops
Miscellaneous Wants
New Industries Wanted
Partners Wanted
Patents For Sale
Patent Attorneys
Plants For Sale
Positions Vacant
Positions Wanted
Properties For Sale
Receivers' Sales
Representatives Wanted
Salesmen Available
Salesmen Wanted
Subcontracts Wanted
Work Wanted
Etc., Etc., Etc.

26

Steel for Service

In the manufacture of

Carnegie Rolled Steel Gear Blanks

a large ingot is first rolled into a cylindrical bloom of proper diameter from which individual discs of the proper length are then cut. These discs are then forged and rolled into gear blanks.

This method of a maximum amount of rolling and forge work will secure a desired close grain structure which will readily yield to final refinement by the proper methods of heat treatment.

This company's engineers will always be pleased to confer with men interested in the question of gears.

Carnegie Steel Company

General Offices: Pittsburgh, Pa.

1068



GRIFFIN F. C. S. WHEELS

embody the results of scientific development, service data, and an engineering investigation.

Our BULLETIN 18 on chilled iron car wheels for street car and interurban service will give you complete data as to patterns, etc.

F. C. S. wheels mean moderate cost, safety, high mileage and brake shoe economy.

All of our foundries are equipped with complete machine shop facilities for pressing wheels on axles.

GRIFFIN WHEEL COMPANY

McCormick Building, Chicago, Ill.

FOUNDRIES

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"STANDARD"

Steel Tires — Steel Tired Wheels
Solid Rolled Steel Wheels
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Steel Forgings — Iron Forgings
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BRAKE SHOE STANDARDS

BRAKE HEADS—to take
Standard Pattern Shoe
One standard driver shoe
One standard car shoe
And there you are—

ASK US

American Brake Shoe & Foundry Co.
30 Church St., New York
McCormick Bldg., Chicago — Chattanooga, Tenn.

"The Quality Shops"
CARS SLC TRUCKS

Apple Pie

—the dream of the "dough boy" and the autocrat of the Yankee breakfast (dinner and supper) table—may be made of the best of materials yet ruined in the *baking*.

Just as railway cars and trucks may be constructed of the best of materials yet be "botched" in the *making*.

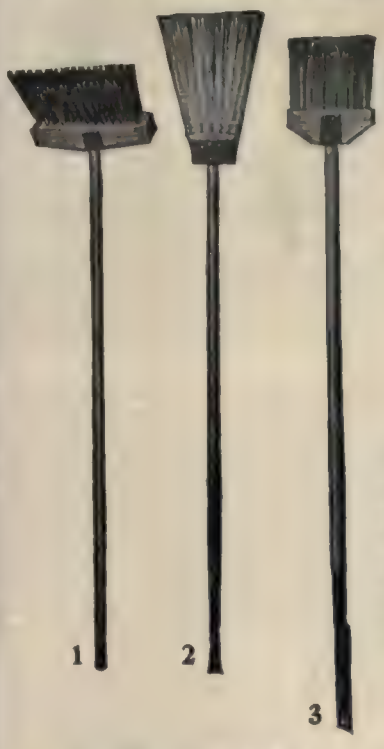
The consistent maintenance of quality demonstrated by the service record of St. Louis cars and trucks is due, not only to the scrupulous care given to the selection and testing of materials, but to the rife experience and esprit de corps of our workers who make them.

We take occasion to express our appreciation of their efforts in our service; and once more recommend the *result* of those efforts to your *service*.

When in need of new cars it will pay you to consult our engineers.

St. Louis Car Company
St. Louis, Mo.

A Great Combination



No. 1 to sweep crossings.

No. 2 to handle light dirt and snow in the frogs, switches, and curves.

No. 3 to remove ice, slush and mud from the same places and a chisel point on the end of the handle to loosen the ice and crust.

No. 1 and No. 3 contain Flat Steel Tempered Wire, and nothing superior can be produced. Serviceable all the year round. Your road is not complete without them.

Write for Prices.

J. W. PAXSON CO., Mfrs.
1021 N. Delaware Ave., Philadelphia, Pa.



FRANKEL Solderless Connectors

W WESTINGHOUSE ELECTRIC

Quickly Installed
Bare both ends of the cable; insert ends to meet in center fittings; screw up nuts.

Readily Released
Unscrew nuts.--Use injures neither cable nor connectors.
Approved by Underwriters.

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.
Sole Agents in the United States

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Third Rail Insulators, Trolley Bases, Poles, Harps and Wheels, Bronze and Malleable Iron Frogs, Crossings, Section Insulators, Section Switches.

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289-93 A Street, Boston, Mass.
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Transmission Line and Special Crossing Structures, Catenary Bridges
WRITE FOR OUR NEW DESCRIPTIVE CATALOG.
ARCHBOLD-BRADY CO.
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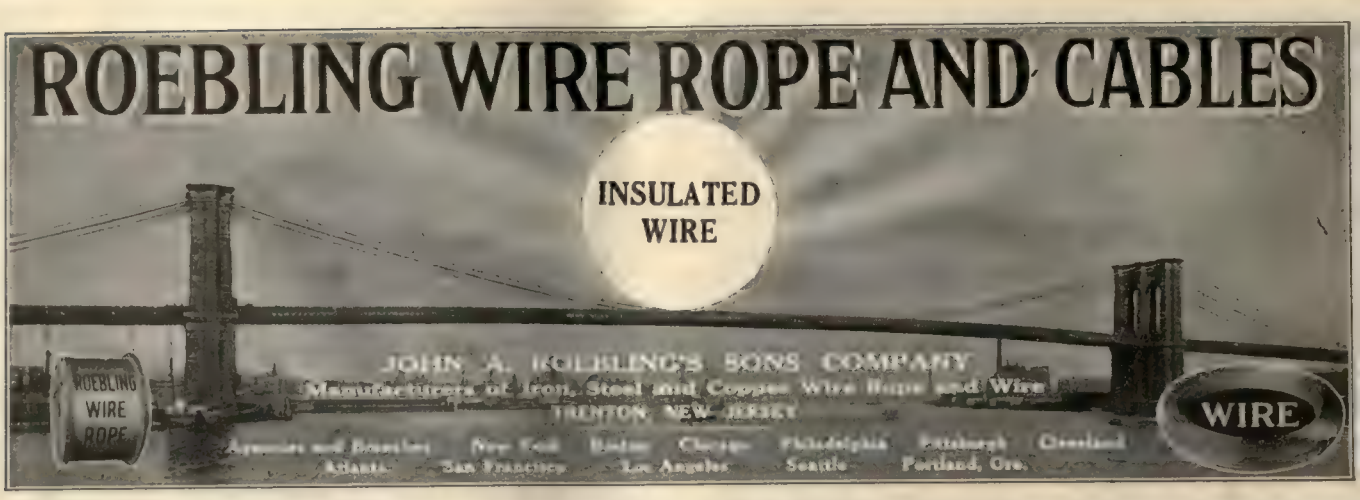
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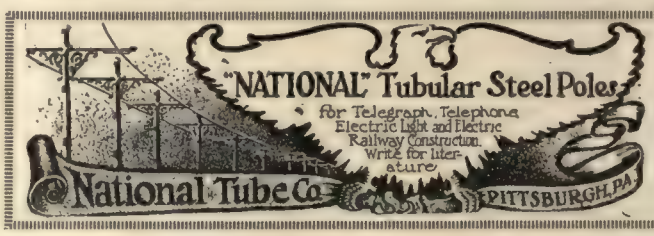
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E. B. BRANDE, Manager, 819 Broad Street, Grinnell, Ia. — M. P. FLANNERY, Manager, Spokane, Wash.

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Commutators, Trolley Wheels, Sleet Trolley Wheels, Trolley Ears, Line Material, Controller Fingers, Brush Holders, etc.

We make quality goods.

THE EUREKA COMPANY, North East, Pa.

Chapman Automatic Signals

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FEDERAL SIGNAL CO.

ALBANY, N. Y.

CONSULT OUR ENGINEERS ON YOUR SIGNAL REQUIREMENTS

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U. S. Electric Contact Signals for

Single-track block-signal protection
Double-track spacing and clearance signals
Protection at intersections with wyes
Proceed signals in street reconstruction work.

United States Electric Signal Co.
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Make 'em Hustle!

Your gangs cannot loaf when the Jaeger Mixer is on the job. Loads, Mixes and Discharges at the rate of a

Mix-a-Minute

and the concrete is cleanly, thoroughly mixed.

Send today for free catalog that shows a Jaeger Mixer built to your individual needs.

THE JAEGER MACHINE CO.
Columbus, Ohio, U. S. A.



NO-CO-RO METAL

"ACME" NESTABLE CORRUGATED CULVERTS

Made of
Galvanized Anti-Corrosive NO-CO-RO METAL
in addition to their primary use as Culverts under roadways and railways, possess

A Wide Range of Adaptability



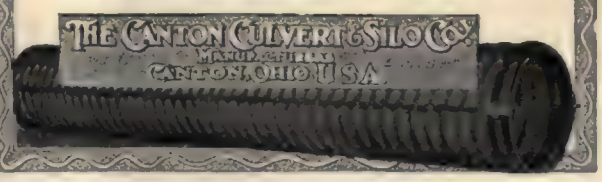
They can be used to form open flumes as shown in our picture.

Since top sections may be easily removed at any point they are ideal as casings for electric cables, for storm sewers and for drainage work.

They make very good centering and reinforcement for many kinds of concrete construction.

In every use the proven lasting qualities of "ACMES" add greatly to their value.

Write for Catalog M-21



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WEATHERPROOF WIRE AND CABLE
PAPER INSULATED UNDERGROUND CABLE
(Single, Duplex and Three Phase)
TROLLEY WIRE
(Round, Grooved or Figure 8)
BARE COPPER WIRES AND CABLES
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(Cotton or Asbestos)

Americanite Rubber Covered Wire — **Incandescent Lamp Cord**
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Phillipsdale, R. I.

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We have been hearing about
SHIPS—SHIPS—SHIPS
and More Ships

Now Think About It
We cannot get those Ships
without
THE RAILROADS

This War
cannot be won without
The Railroads

THE RAIL JOINT COMPANY
61 Broadway — New York City

Kilby Frog & Switch Co.
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Tongue Switches, Mates, Frogs, Curves and Special Work of all kinds for Street Railways

TRAILS AND NELSONVILLE FILLER AND STRETCHER BRICK
offer all the advantages without the disadvantages of the groove rail.
Construction approved by City Engineers.
THE NELSONVILLE BRICK CO., Nelsonville, Ohio

DREW MONEY SAVERS

Drew Motorman's Safety Mirrors—Prevent Accidents.
Drew Pole Sleeves—Make Old Steel Poles as Good as New.
Samson Splicers—"Least cost per car Mile."
Drew Frogs and Crossings—Obviate "trolley off."
Drew Clinch Ears—Absolutely dependable.

Send for Drew Catalogue No. 18

DREW ELECTRIC & MANUFACTURING COMPANY
Offices and Works, 1016 E. Michigan St., Indianapolis, Ind.

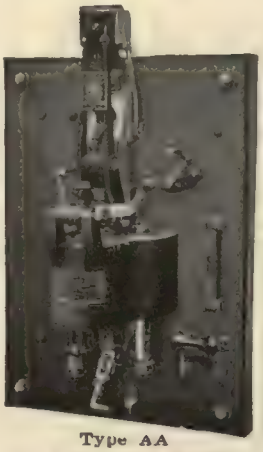
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Beats Solid Copper 40 Ways
Cheaper—Lighter—Stronger—Higher Elastic Limit—Costs Less to Maintain

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Self Operating D. C. Sub-Stations



Type AA

If Uncle Sam should draft all the sub-station operators off their jobs it would certainly put a lot of railway power plants down and out. But *not those*

Equipped With

AUTOMATIC RECLOSING CIRCUIT BREAKERS

These remarkable protective devices open in case of overload or short circuit, and reclose automatically upon removal of same. They can also be arranged to automatically shut down the machine in case of hot bearings, Hot Transformers, A.C. Voltage Failure, Reverse Current overspeed, etc.

The Automatic Reclosing Circuit Breaker Co.
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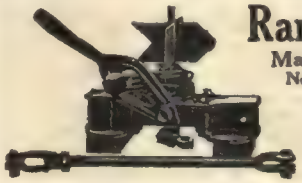
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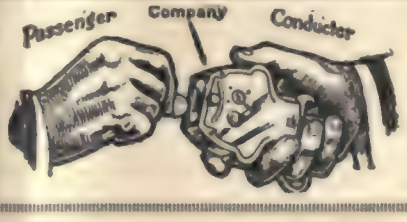
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In his recent company section address on "Our Job," abstracted in the issue of this paper for May 4, N. W. Bolen raised and answered the question as to why men remain in electric railway work under the present strenuous conditions. His only answer to this was that to the men fitted for the work it makes an irresistible appeal. If one is "called" to this work he will stay by it through thick and thin. If he has at any time a tendency to feel a little blue all that is necessary is a freshening of the conviction that his work is worth while because it furnishes something which the people cannot do without.

What is true with regard to the operating side of the business is equally true of the manufacturing side. Railway men cannot give good service without good equipment. Cars are needed and will continue to be needed, fitted with modern motors, controllers, brakes and all sorts of economical and convenient devices. These cars must roll on rails supported on modern ties, and they will require power which must be produced cheaply and transmitted economically. Reliable signals must make possible the safe and speedy operation of these cars. To be sure, the railways are not buying maintenance supplies as they would in normal times and few extensions are being made. But even now in the aggregate the business is a tremendous one, and when the railways again come into their own, as they must do in the reasonably near future, the wear and tear of these "off" years will be made good and the arrested growth will be compensated for by well considered expansion.

Reprinted from Editorial Pages *Electric Railway Journal*, May 18, 1918.

Electric Railway Journal, 10th Ave. at 36th St., New York

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P-175, Elec. Ry. Journal
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complete with condenser, direct connected to 360 kw. General Electric

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Specifications of Engine:

High pressure cylinder 16 in. bore.
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GENERAL auditor or secretary-treasurer Public Utility Company wants position. Twenty years' experience gas, electric, street railway accounting. Minimum salary $3000. PW-154, Elec. Ry. Journal.

MASTER mechanic wants position, man with experience both city and interurban. Can furnish best of reference. PW-160. Elec. Ry. Journal, Cleveland.

MASTER mechanic wants position; experienced on city and interurban cars; familiar with G. E. and Westinghouse multiple control. Can maintain equipment at high standard. PW-169, Elec Ry. Journal, Cleveland.

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Sanders, Track.
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Holden & White, Inc.
Nichols-Lintern Co.
Ohio Brass Co.
St. Louis Car Co.

Sash Fixtures, Car.
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Sash Metal, Car Window.
Hale & Kilburn Co.

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Hale & Kilburn Co.
St. Louis Car Co.

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Electric Service Supplies Co.
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Nichols-Lintern Co.

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Consolidated Car Heating Co.
Electric Service Supplies Co.
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Your Trolley Bases



It is to your advantage to install the best appliances on your cars and particularly at this time when absolute reliability of transportation facilities is demanded.

Nuttall Ball and Roller Bearing trolley bases minimize the effects of track and overhead inequalities.

Drop a card for detailed information.

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PITTSBURGH

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City and Interurban Cars and Trucks,
Snow Sweepers and Plows,
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Electric Locomotives

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-for good commutation



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519 West 38th Street, New York City. DISTRICT AGENTS: Lewis & Roth, Philadelphia; Electrical Engineering & Mfg. Co., Pittsburgh; W. L. Rose Equipment Co., St. Louis, Mo.; Herzog Electric & Engineering Co., San Francisco, Cal.; W. R. Hendrey Co., Seattle, Wash.; Charles Farnham, Los Angeles, Cal.

OXWELD



THE STEADY CLIMB UPWARD

FROM one end of industry to the other—from the makers of munitions and war supplies of the most ponderous or delicate character (including aeroplanes), to the owner of a big or little scrap heap—you will find that the word of highest praise is reserved for Oxweld.

The evidence is overwhelmingly in favor of the injector type of blowpipe and the low pressure generator.

In all cutting or welding operations this system maintains an absolutely constant pressure that is as unvarying as the power in a Packard Twin Six. There are no wires to connect or get out of order. Cool generation keeps the blowpipe from getting clogged. The Oxweld syphons all the gas from the cylinders—no other type does.

We can send you figures showing what Oxwelds are saving for others in your line of business—no matter what it is—figures that will surprise you.

They save so much that the cost is hardly considered.

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World's Largest Makers of Acetylene Apparatus and Supplies

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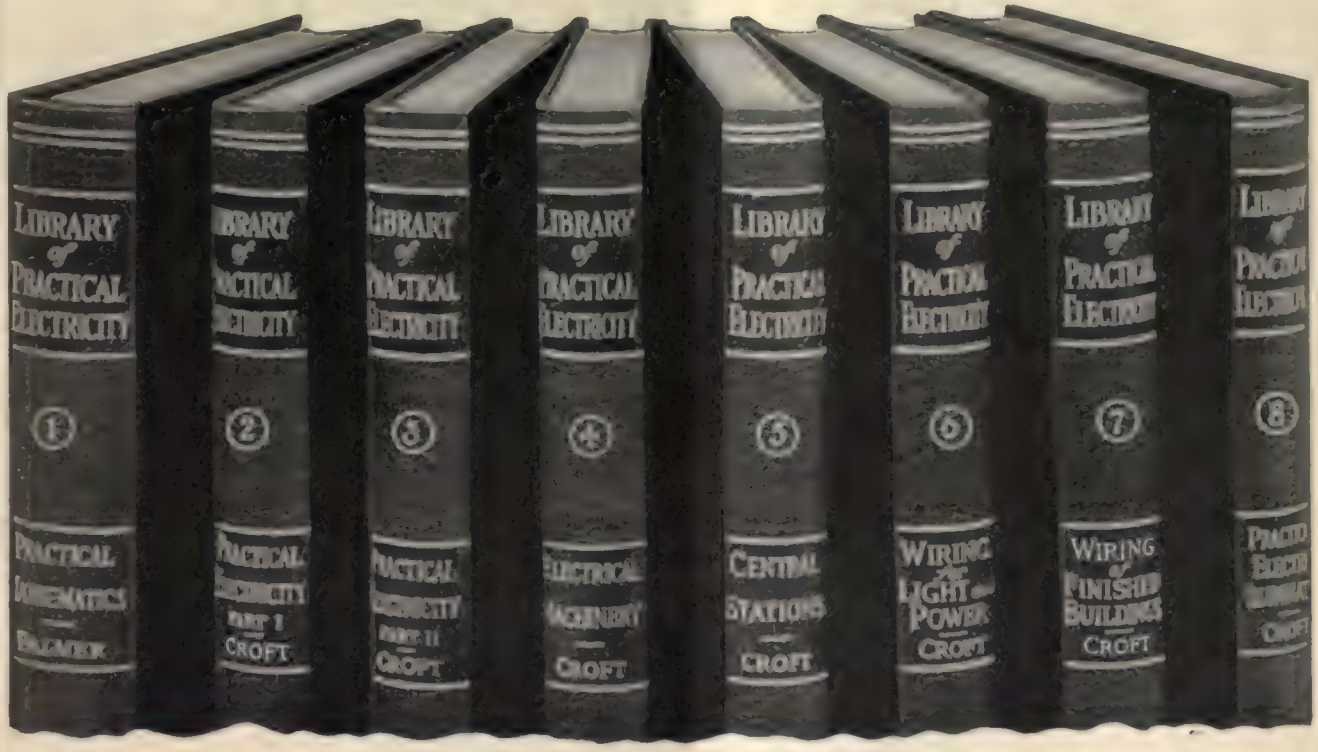
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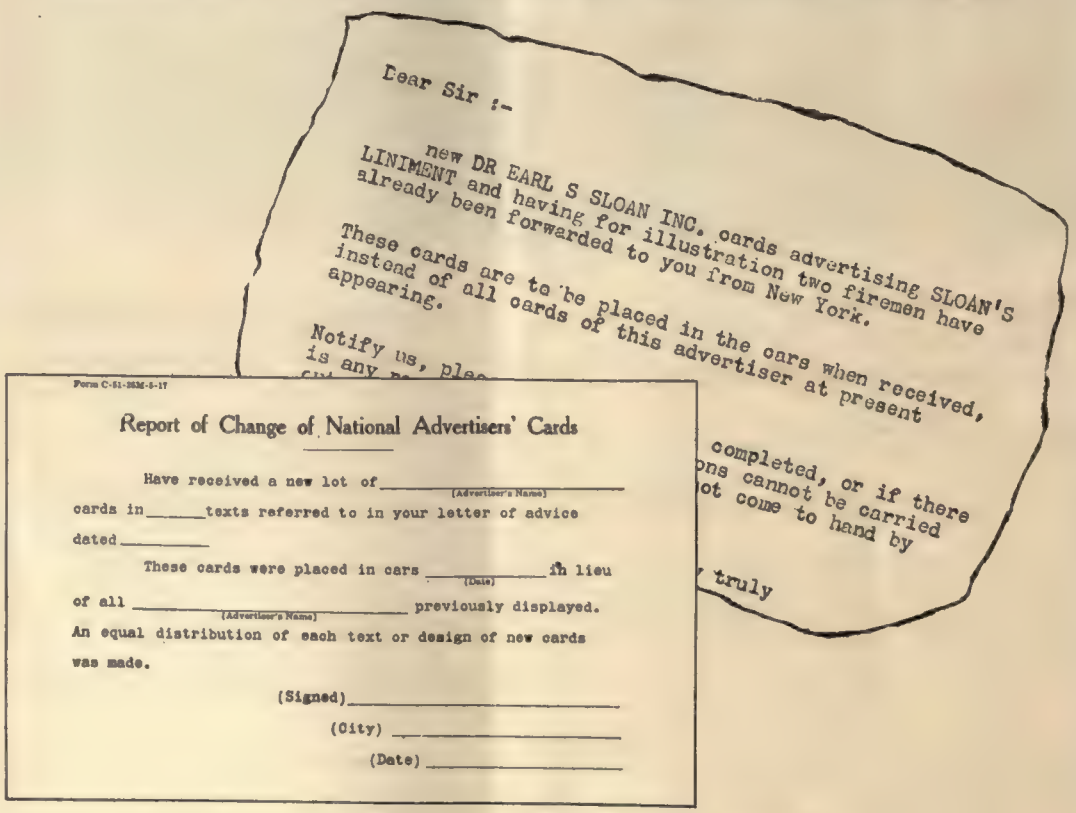
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Occupation E-6-8-18

COLLIER SERVICE *at* BEAUMONT, OIL CITY *of* TEXAS

These forms are reproduced to show some of the inside detail of carding that go to make up Collier Service.

The car carder is under the immediate direction of the territorial Collier office, but the forms and procedure are the same throughout the land.

This particular letter of advice went recently to the Collier carder at Beaumont, Texas. It is typical of the consistent change of copy and careful follow-up that Collier Service gives as a matter of course to maintain its high standards of car card advertising. And it is only through the setting and maintenance of such standards by Collier Service that the income from car card advertising has been so widely stabilized for the electric railway industry.



Dear Sir :-

new DR EARL S SLOAN INC. cards advertising SLOAN'S LINIMENT and having for illustration two firemen have already been forwarded to you from New York.

These cards are to be placed in the cars when received, instead of all cards of this advertiser at present appearing.

Notify us, plea
is any re

completed, or if there
ons cannot be carried
ot come to hand by

truly

Form C-51-3SM-5-17

Report of Change of National Advertisers' Cards

Have received a new lot of _____ (Advertiser's Name)

cards in _____ texts referred to in your letter of advice dated _____

These cards were placed in cars _____ (Date) in lieu of all _____ (Advertiser's Name) previously displayed.

An equal distribution of each text or design of new cards was made.

(Signed) _____

(City) _____

(Date) _____

Barron G. Collier INCORPORATED

Candler Building

220 West 42nd Street, New York City



Peter Witt Cars for Quicker Schedules

THE fact that passengers enter, distribute themselves properly and leave Peter Witt Cars without a word of direction or urging, is good proof that the front-entrance, center-exit, pay-as-you-pass plan is correct for heavy traffic city lines. In all of the cities where they are in operation these cars are saving half the time at terminals and principal street stops, producing faster schedules, allowing more cars to be put on the lines, carrying more passengers and carrying them more comfortably, giving plenty of time for collecting fares and preventing missed fares. Buffalo has just received thirty more, like the one pictured above, making one hundred and thirty for her busiest lines.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR COMPANY
ST. LOUIS, MO.

G. C. KUHLMAN CAR CO.
CLEVELAND, OHIO

WASON MANUFACTURING CO.
SPRINGFIELD, MASS.

The GE-258 Motor

For Fast Service and Less Maintenance

The GE-258 motor has the greatest capacity for its weight of any railway motor ever manufactured. This high capacity permits, without injury to the motors, the highest practicable rate of acceleration—a most important feature on frequent-stop lines and in congested streets, resulting in faster schedule speed. This attracts traffic, for passengers like the feeling of hustle and rapid movement which they obtain in these cars.

The low weight of these cars eliminates much of the repair work on the track, while the small current taken reduces wear on the trolley wire and requires less feeder copper.

25-2



General Electric Company

General Offices:

Sales Offices

Special Mechanical and Engineering Edition

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Company, Inc., June 15, 1918



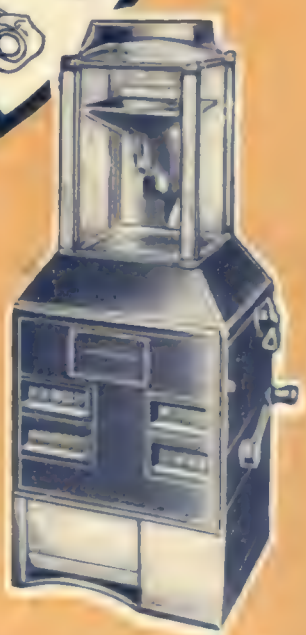


Johnson Electrically Driven Platform Box

Install Johnson fare boxes and metal tickets and get that 20 per cent.—the 80 per cent. will take care of itself automatically. With so many inexperienced men taking the place of your old reliable crews it is more important than ever before to make fare collection a mechanical operation.

The Johnson Fare Box System

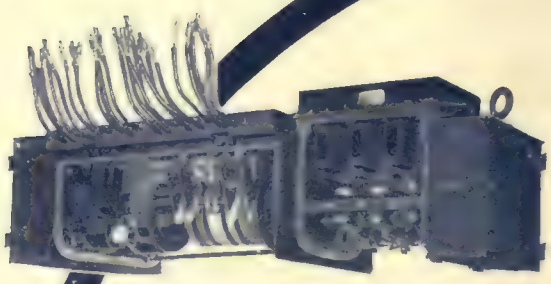
provides a double check on cash fares and metal tickets collected. There is a Johnson for every service. Investigate the type that's made for you.



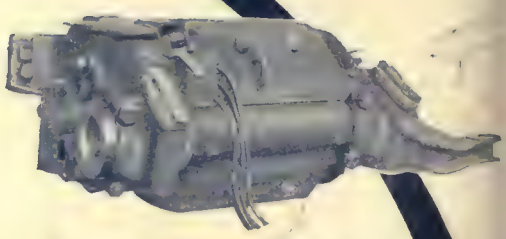
Johnson Combination Coin and Metal Ticket Box

Johnson Fare Box Co., Chicago, Ill., U. S. A.

Westinghouse



H L D Control



No. 514 40 Horsepower Motor

Public Service

The Public Service Railway Company of New Jersey has been confronted with perhaps the most difficult transportation problem in the country.

The State of New Jersey is dotted with important industries, shipyards, etc.—all endeavoring to increase production to the utmost.

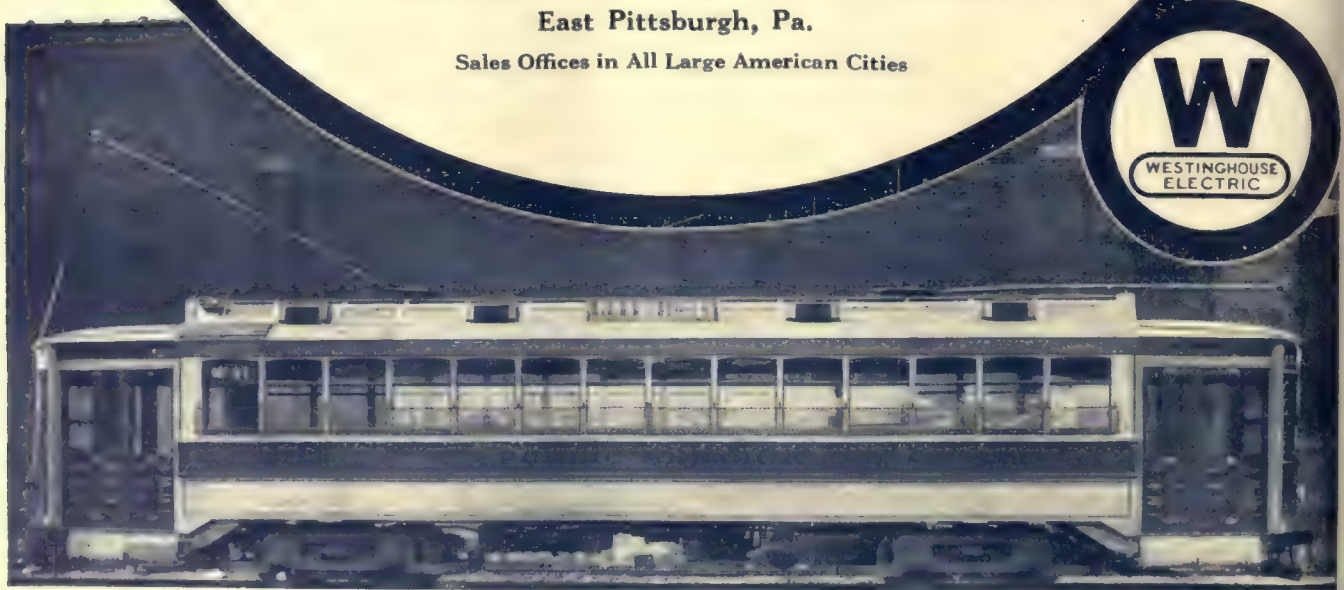
Reliable transportation service is the aim of the Public Service Company in assisting the government. It recently purchased 25 Westinghouse HLD Control and 33 standard Westinghouse HL control equipments, together with 172 No. 514 and 66 No. 307 Westinghouse Motors.

Westinghouse Electric & Manufacturing Co.

East Pittsburgh, Pa.

Sales Offices in All Large American Cities

W
WESTINGHOUSE ELECTRIC



Vol. 51, No. 24 New York, June 15, 1918 Pages 1123 to 1176

Electric Railway Journal

H. W. BLAKE, *Editor*

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SMOKE

The Enemy's Ally

WHEN American Industries take a holiday every week to save a million tons of coal to meet an emergency—

WHEN our Government tells us that we are wasting 120,000,000 tons of coal a year—

THEN it is time for us to face two big facts—

(1) This waste will not stop until we adopt better furnace methods and smoke prevention devices, and that—

(2) Just as sure as we are *collectively* responsible for this waste, just as surely the waste will not stop until we *individually* determine to fight inefficiency at our own back door.

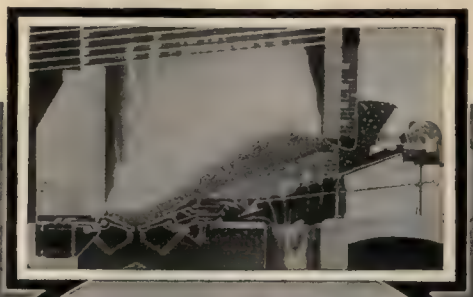
The back door of American Industries is the FURNACE ROOM.

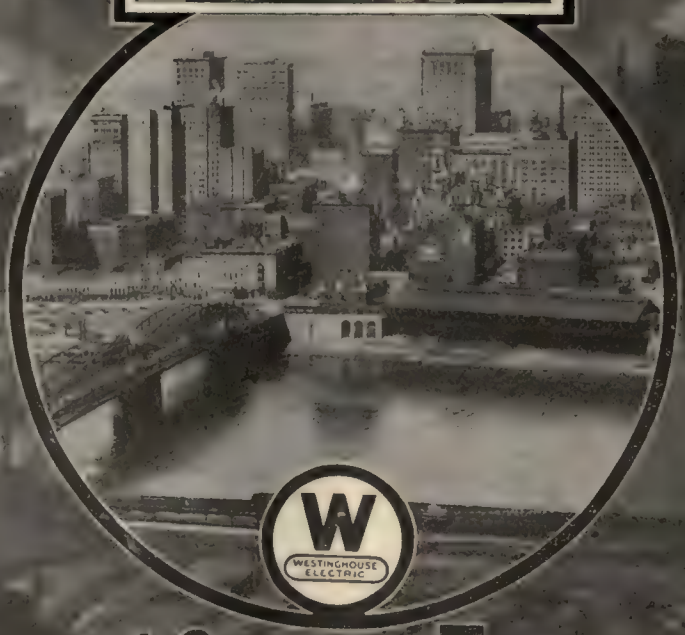
Determine now to improve furnace methods—lest the iron heel of Autocracy crush us while we deliberate.

The Westinghouse Underfeed Stoker is unsurpassed in the ability to burn fuels efficiently.

Every particle of combustible matter must pass upward, through the white-hot fuel bed, and the flame zone above. There is no possible way for the combustible matter to escape in the form of smoke before being completely and efficiently consumed, and transformed into available energy for turning the wheels of production.

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.





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Air Compressors



Type D-4-K



Type D-1-F

Westinghouse Air Compressors cover a broad field of service. Meet all operating conditions. Can be fitted to any current. Capacities range from 10 to 150 cubic feet per minute. Write to our nearest office.



Type D-4-R



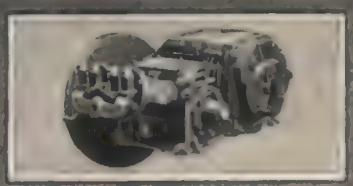
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Type D-2-J



Type E-4-F



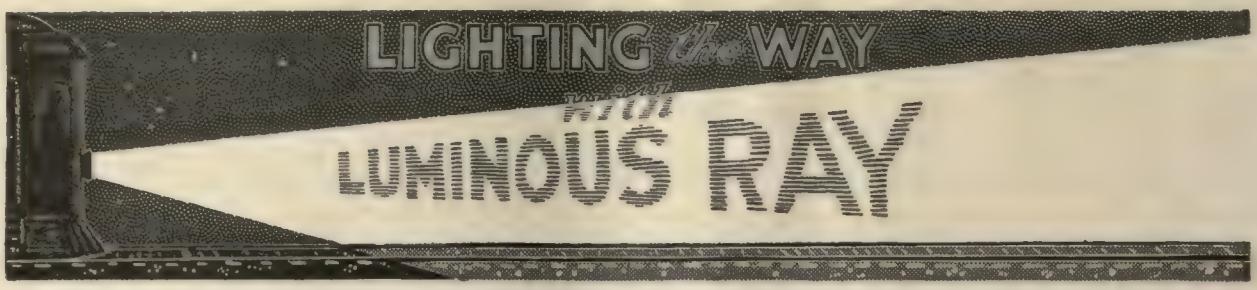
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Brake Building our Business for a Lifetime

Westinghouse Traction Brake Company

General Offices and Works, Wilmerding, Pa.

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Mexico City
New York, N. Y.
Pittsburgh, Pa.
San Francisco
Seattle, Wash.
St. Louis, Mo.
St. Paul, Minn.





Day-Time Safety at Night with Imperial Luminous Arcs

Even on extremely low voltage—out at the end of the line, or on a steep hill—Imperial Luminous Arc Headlights project a clear powerful effective shaft of light. It shows the motorman without strain where he is going. It warns traffic on intersecting highways. Imperials bring safety.

They stay on the cars and out of the shop with far less attention than their effectiveness would justify.

Shall we demonstrate an equipment on your road?

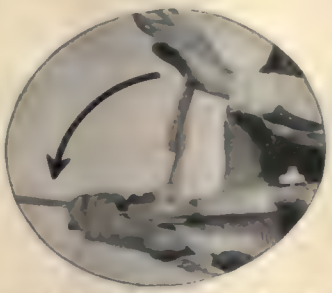
THE OHIO BRASS COMPANY, MANSFIELD, OHIO

General Sales Agents in U. S. for Crouse-Hinds Imperial Headlights

O-B PRODUCTS



Slip tip under hooks—



turn over and down on the wire—



clinch the lips and the job is done.

O-B TROLLEY FROGS PREVENT TRAFFIC DELAYS

Simplicity causes O-B Trolley Frogs to go up on the line with minimum delay to traffic. Their strength and endurance keep them there.

Trolley wires are anchored by a single powerful clamp secured in the Type E by two bolts, in the smaller Type D by one.

O-B Bronze Cam Tips form the approaches. The pictures show how easily they slip into place. These Tips make a smooth path for the wheel from wire to pan. It is easy to renew them.

THE OHIO BRASS COMPANY, Mansfield, Ohio

New York **Philadelphia** **Chicago** **Los Angeles** **San Francisco**



O-B Type D Frog, suitable for moderate speeds and all general city service



O-B Type E Frog, adapted for high speed service and for use where several types of cars are operated over same line

Send for "Saving Time on the Line." It describes the complete line of O-B Cam Tip Devices.

Phono-Electric

11,000 Volt Contact Wire in The Hoosac Tunnel Zone

The Hoosac Tunnel, one of New England's most important traffic links, handling about 100 trains a day, has been fitted with **Phono-Electric Trolley Wire** ever since it and its appoaches were electrified.



The tunnel wire is 15 feet above the rails and the approach wire 22 feet above the rails.

The same **Phono-Electric Contact Wire** for this 11,000 volt, 25 cycle service has been in use since May 27, 1911—7.92 miles of route and 21 miles of track.

Heavy service and sudden changes in clearance are no burden on **Phono-Electric Trolley Wire** because of its toughness in composition and trueness in gage.

Bridgeport Brass Company
Bridgeport Connecticut

Why

INTERNATIONAL
STEEL TWIN TIES
Are Superior

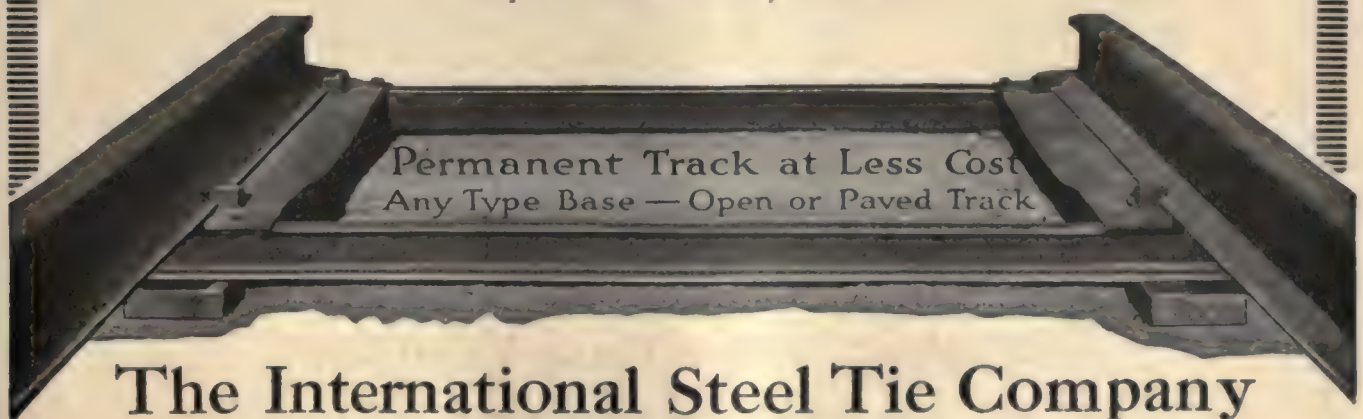
They are designed to give the most service with the minimum amount of materials. The large tie bearing plate at the top instead of the bottom of the tie and parallel with the rail, puts all the concrete or ballast to work. The trussing of these plates gives them bending strength and forms a tamping pocket. In the case of a concrete foundation this trussing grips the set concrete and insures a full distribution of the track loads.

By offsetting the rail fastenings from the tie anchorages or the channels, the rail wave is not retarded. The clips are malleable iron castings of the tapered jaw type. They clamp the rail to the tie plate and resist shock and movement with a 1¼ in. square section of metal.

Seven inches instead of 12 in. of concrete beneath your rail gives track a resiliency not obtainable with any other type of construction. This is largely responsible for the excellent results these ties are giving in service. And when the track structure must be removed it is much simpler to remove 7 in. of concrete than 12 in. A combination of all permanent materials makes such a requirement very remote.

These are all engineering considerations which are worth your attention. The design is right, the cost is low and the service of Steel Twin Ties is unexcelled.

Prompt deliveries made from stock.



The International Steel Tie Company

Manufacturers of Steel Twin Ties and Crossing Foundations

General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

Western Eng'g Sales Co. Los Angeles, Cal. — San Francisco, Cal. Seattle Wash — R. J. Cooper Co., Salt Lake City, Utah. — J. E. Lewis & Co. Dallas, Texas. — Maurice Joy, Philadelphia. — William H. Ziegler, Minneapolis, Minn



Protects Wood from Ravages of Time and Weather

REGARDLESS of what use you make of wood—whether it is for poles, cross arms, line fence posts, cross ties, or for any other purpose—you can give it longest possible life by treating it with **R. W. P. O.**

There is nothing quite so good as **R. W. P. O.** for the preservation of wood. It penetrates deeply and stays there.

IT CANNOT dissolve or evaporate. Once it is applied, the wood is protected against decay and insect attack.

R. W. P. O. will outlast the life of the timber. It is absolutely free from adulterants and volatile elements.

We are in a position to make immediate shipments. Prices gladly quoted on treated posts, poles, ties and dimension timbers.

Republic Creosoting Company

Indianapolis, Indiana

Plants: Indianapolis Minneapolis Seattle Mobile Norfolk

Your Car Signs are actually the first line of contact with your riding public—improve them, use these illuminated signs.



Typical Keystone Type



Typical Hunter Type



Typical Keystone Type



Typical Hunter Type

They furnish an excellent inducement to ride, they advertise your service.

They make easy the re-routing of cars and the shifting of them from one barn to another.

They are complete in themselves. Parts are interchangeable. Uniform tension on curtains. Curtains and mechanism removable. Curtains interchangeable in types of equal length. No tools necessary to change curtain. Easily cleaned.

Write for complete data.

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

Canadian Distributors: Lyman Tube & Supply Co., Montreal, Toronto, Winnipeg.

One Year Ago Only 49 Electric Railways were using

PERRY-HARTMAN BEARINGS



102 Roads Are Now Using Them

If your name is not among these railways you are overlooking an opportunity to cut down operating expenses. Both operating and financial conditions have led these companies to adopt Hartman self-centering center plates and Perry anti-friction side bearings to reduce wheel and flange wear, wheel turnings, rail wear and current consumption on curves.

Albany & Southern
Atkieselskabet Holmenkolbanen, Norway
Arkansas Valley Interurban
Asheville & Eastern Tennessee
Auckland Elec. Tramways
Aurora, Elgin & Chicago
Binghamton Ry. Co.
Beaver Valley Traction
Bloomington, Pontiac & Joliet
Brooklyn Rapid Transit
Buffalo & Lake Erie
Buffalo, Lockport & Rochester
Calgary Street Railway
Capital Traction Co.
Cedar Rapids & Marion City
Central Illinois Trac. Co.
Chambersburg, Greencastle & Waynesboro
Charles City & Western
Chautauqua Traction Co.
Chicago, Aurora & DeKalb
Chicago Elevated Rys.
Chicago & West Towns
Cleveland & Eastern
Cleveland & Erie
Cleveland, Painesville & Eastern
Columbia Ry., Gas & Electric
Colorado Springs & Interurban
Conestoga Traction Co.
Dallas Street Ry.
Denver Tramways Co.
Des Moines City Ry.
East Liverpool Trac. & Light
East St. Louis & Suburban
Emergency Fleet Corporation
Empire State Rys.
Erie Ry. (Elec.)
Evanston Ry.
Evansville Rys. Co.
Fonda, Johnstown & Gloversville
Ft. Wayne & Northwestern
Gary & Interurban
Georgia Ry. & Power
Harrisburg Rys.
Honolulu Rapid Transit Co.
Houghton County Traction Co.
Houston Electric
Interboro Rapid Transit
Jamestown St. Ry.
Joliet & Eastern
Joplin & Pittsburgh
Kansas City, Clay County & St. Joseph
Lackawanna & Wyoming Valley
Lake Shore Electric
Lehigh Valley Transit Co.
Little Rock Ry. & Elec. Co.
Louisville Ry. Co.
Macon Ry. & Lt. Co.
Mahoning & Shenango Ry. & Lt.
Manhattan City & Interurban
Manila Elec. R. R. & Light Corpn.
Maryland Elec. Co.
Mason City & Clear Lake
Michigan Ry. Co.
Newport News & Hampton Ry. Gas & Elec.
New York State Rys.
New York, Westchester & Boston
Norfolk Southern Ry.
Northern Ohio Trac. & Lt.
Northern Texas Trac. Co.
Oakland, Antioch & Eastern
Ogden, Logan & Idaho
Oklahoma Ry.
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Pacific Gas & Electric
Peoples St. Ry.
Philadelphia Rapid Transit Co.
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Savannah Elec. Co.
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Scranton Ry.
Southern Cambria Ry. Co.
Southern New York Pwr. & Ry.
Southern Public Utilities
Southern Traction Co.
Southwest Missouri R.R.
St. Joseph Ry., Lt., Ht. & Pwr.
Texas Electric Co.
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United Gas & Electric Co.
Washington, Baltimore & Annapolis
Waterloo, Cedar Falls & Northern
West Penn Ry.
Wilkes-Barre Ry. Co.
Winnipeg Elec. Co.
York Rys.

Send for Catalogue and Dimension Sheets.

Holden & White Inc.

Electric Railway Sales Distributors for The Joliet Railway Supply Company

817 Fisher Building, Chicago

Northern White Cedar Poles



Lines of the Burlington Traction Company, Burlington, Vermont,—Interurban line. Photo recently taken between Winooski and Essex Junction.

The data on this pole line says that these poles have been in service *over* 20 *years* and are still in good condition.

There are many NORTHERN WHITE CEDAR POLE Lines in different sections of the country in service from 15 to 20 years which prove conclusively the *Long Life* of NORTHERN WHITE CEDAR POLES.

Northern White Cedar Association

Lumber Exchange, Minneapolis, Minn.



At Seattle

"Deltabeston" Magnet Wire

Aids Reliable Operation Over Grades

Like so many other Pacific Coast cities, Seattle is rich in hills. The steepest are handled by cable, but electric cars climb grades up to 15 per cent. just the same.

At one time, it was feared that the motors wouldn't stand the extra work involved in running on such grades.

But the fields were rewound with Deltabeston Magnet Wire—the wire that permits safe operation at a rise in temperature that would otherwise be costly if not dangerous.

And by the way, the schedule speed in Seattle on a number of lines has also gone up from 8.5 to 10.1 m.p.h.

Are *you* acquainted with the "D & W" products?

Deltabeston Wires **Delta Tape** **Delta Sheeting**
D & W Enclosed Fuses **Oilfuse Cut-outs**

DELTABESTON WIRE

D & W FUSE CO.

PROVIDENCE, R. I.

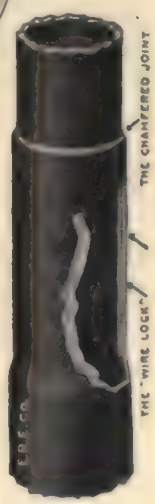
D&W REG. U.S. PAT. OFF.

Missoula, Mont.



Believes in Bright Streets

It also believes in the simplest, most durable pole line construction—witness this view of Higgins Avenue, showing part of an installation of 116 Fig. 10154 Brackets mounted on



Elreco Combination Poles

For Railway and Lighting Use.

The curb line isn't obstructed by separate lamp standards, because the tubular poles perform the double duty of carrying the span-wires and lights. The cost of lamp standards is saved, and an installation secured of which the city may well be proud. The chamfered joint of Elreco Poles prevents rusting—and the "Wire Lock" swedge assures a joint which cannot "telescope." Ask for information about Elreco specialties for electric railways.

These poles combine lowest cost, lightest weight, least maintenance and greatest adaptability.

Electric Railway Equipment Co.

Cincinnati, Ohio

New York: 30 Church St.



Girder rails, Water Street, Elmira, N. Y.—replaced by "T" rails and Nelsonville Filler and Stretcher Brick.



Why Hesitate?

"T" Rail or Girder Rail

Why go to the expense of a girder rail track when the **"T" rail** with NELSONVILLE **Filler and Stretcher Brick** will insure a *better* job at less trouble and expense?

Kickups? NELSONVILLE *prevents* them. The joint between the filler and stretcher bricks is left ungrouted, making it impossible to transmit rail vibration. This eliminates the danger of displacement so frequent when the old-style nose brick is used.

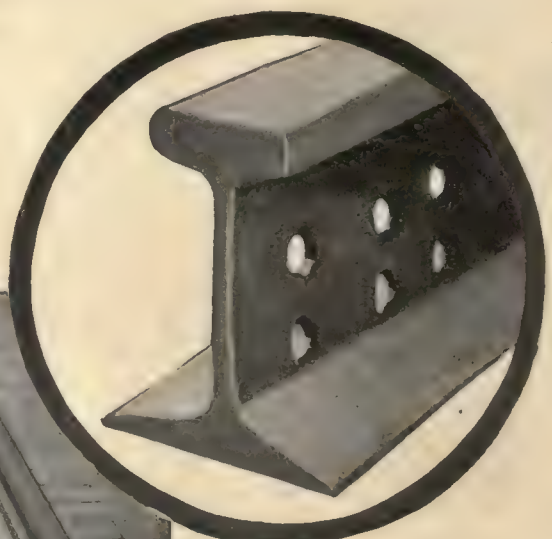
NELSONVILLE Filler and Stretcher Brick are 9 in. long, made in shapes to fit any standard type of rail. Much easier to lay than nose brick, as they fill three-times the space.

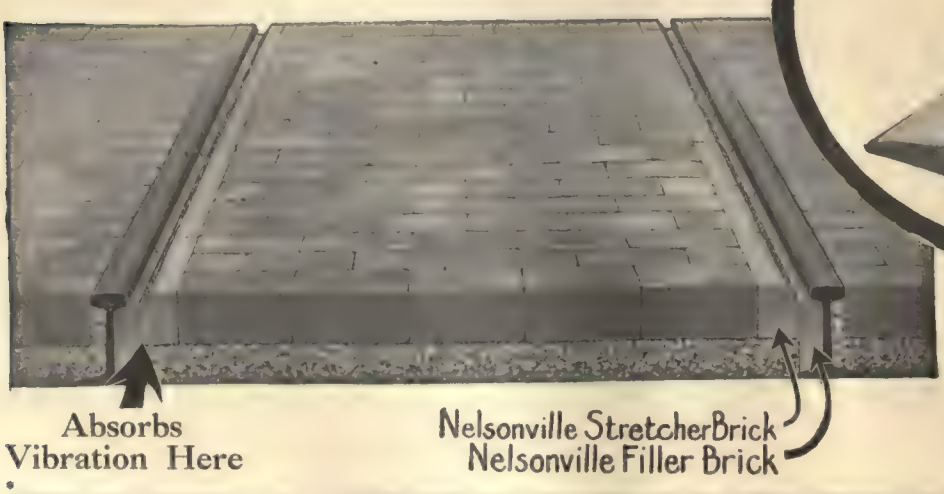
There is so much to be said about their many advantages and their successful use by leading railway companies that you should certainly see our literature.

Write for full details today

The Nelsonville Brick Co.

Nelsonville, Ohio





ARC-WELDING—RAIL BONDING TRACK REPAIRS—SHOP WELDING

A Lincoln Outfit will do all the work most economically and quickly

NO MATTER where the job is—on paved construction or on private right of way—whether laying rails or repairing old ones, there is a single, light, portable outfit that can be easily taken to the job, and it will do *all the work*—

LINCOLN DYNAMOTOR

Rails may be joined permanently with Gailor welded joints, at the rate of 2 to 2½ per hour, with 3 men under 3 minute traffic.

Lincoln Bonds for the return circuit may be applied to rails on open track construction without interrupting regular traffic schedule, at the rate of 150 per day. They can be welded with but one-sixth K.W. per bond in 45 seconds—at a saving of 25 to 35 cents per bond.

In building up cupped rails and for general track and shop welding the Lincoln Dynamotor is *ideal* because it is so light and easy to handle and work is done so quickly and permanently. The welded section will last as long as the rail to which applied.

We will welcome an opportunity to explain in detail the Lincoln Systems and Dynamotors.

Write us or our nearest agent, today!



Gailor Welded Rail Joint



Lincoln Rail Bond

THE LINCOLN BONDING CO.

General Offices: CLEVELAND **New York Office: 30 Church St.**

BOSTON, Chas. N. Wood Co.
PHILADELPHIA, Railway Trackwork Co.
PITTSBURGH, Electrical Engineering & Manufacturing Co.

AGENTS:
CHICAGO, Holden & White, Inc.
ST LOUIS, W. L. Rose Equipment Co.
CANADA, Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Winnipeg.

ERICO

Portable Welder

FOR RAIL BONDING OR ARC WELDING

It has no rotating parts, therefore no commutators or bearings.

The Welder Portion shown in the photograph weighs but 65 pounds complete with mounting. It is easily handled by one man. No flames or arc strikes either the rail or the bond.

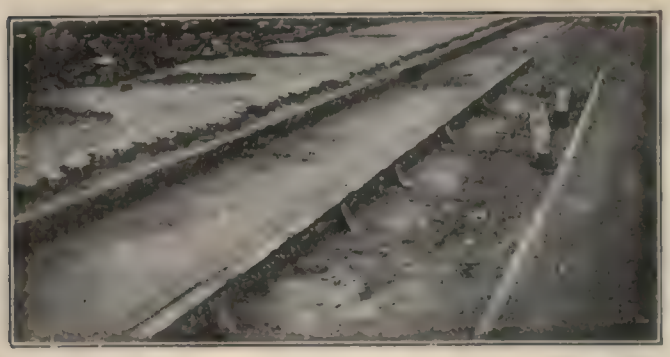
Small investment. Prompt delivery.

The Electric Railway Improvement Co.
Cleveland









Prevention of Only One-Tenth of This Would Have Saved One and a Half Million Dollars

No electric railway company was replacing during 1917 any track for which replacement was not an absolute and unescapable necessity.

Nevertheless, in that year, with the cost of everything skyrocketing, the electric railways of the United States and Canada found it necessary in spite of these adverse conditions to replace 375.4 miles of track. This was purely replacement of worn out track; not extensions. A fair cost for track under normal pre-war conditions would be about $40,000 a mile average. Fifteen million for the total.

Now assume that the use of a

RECIPROCATING TRACK GRINDER

on only 10% of the mileage (or 37½ miles) had made it unnecessary to replace that 10%, at least for several more years. The electric railway industry would have saved in 1917 a million and a half dollars, wouldn't it?



And the expenditures necessary to achieve that saving would have been so small *in comparison* as to be almost negligible.

A good many companies have made just such big proportionate savings in just that way.

Railway Track-work Company

30th and Walnut Streets, Philadelphia

AGENTS: Holden & White, Inc., 343 S. Dearborn St., Chicago.

Cut Down Your Rail Expense



You can easily double the life of your rail equipment and

Reclaim Your Old Rails

by reinforcing them at all vital spots with

Indianapolis Welded Joints

They will become as fit as brand new rails to withstand the heaviest traffic, because the joints are made of the toughest materials obtainable and require no bonds.

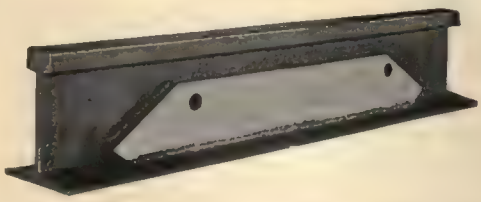
Tests by the U. S. Bureau of Standards show less than .02 inch deflection at maximum wheel load and an actual conductivity of 138% compared with unbroken new rail.

Do you wonder why hundreds of leading railway companies have permanently adopted this method of doubling the present life of their rails?

Any user of an Indianapolis Welder will advise you not to be without one. There are one or more users in your neighborhood.

The savings in reclamation of track special work, worn and battered rail and parts of equipment will immediately write off the small initial investment, then go on earning money for you.

Users of Indianapolis Patented Welders, Joints and Welding Supplies are fully protected.



The "Simplex" Joint
for High Tee Rails



The "Apex" Joint
for Guard and Girder Rails

No Bonds Required—Increased Conductivity

Send for details.

Indianapolis Switch & Frog Company, Springfield, Ohio

Variable Voltage Means Better Welds

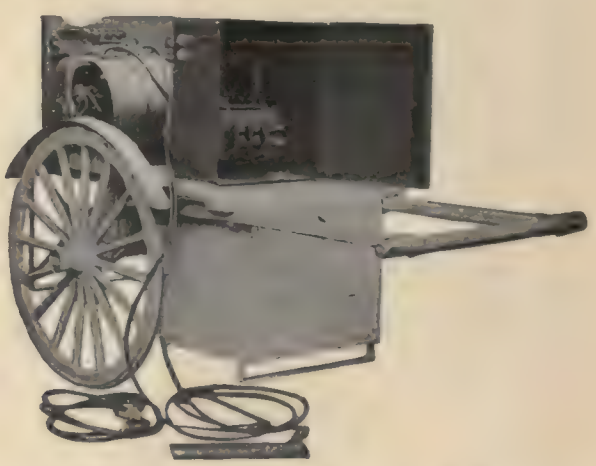


Your heat is under better control when you use the "Variable Voltage" generator of the Lincoln Arc Welder.

Lincoln Arc Welders

avoid losing from 50% to 80% of your power through wasteful ballast resistances and you get rid of all those relays, clapper switches and safety devices met with in the usual welding machine which begin by making you wonder how it all works and end up by "falling down on the job" when they are needed.

Leading railroads, foundries and factories of all kinds are saving thousands of dollars yearly by the use of the Lincoln Arc Welder—and they are getting better results.



This is the outfit, a standard motor connected to a generator, and all controlled by a single switch panel.

Investigate "variable voltage" and the Lincoln Arc Welder.

Write for bulletin No. 104-J.



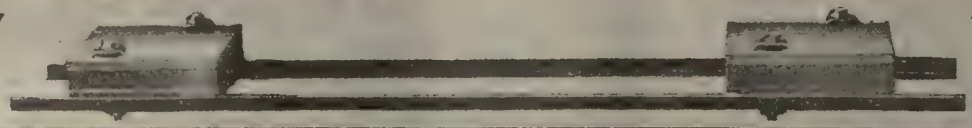
The Lincoln Electric Co.

CLEVELAND, O.

New York City	Columbus	Charlotte, N. C.
Syracuse	Detroit	Montreal
Buffalo	Pittsburgh	Toronto
Boston	Minneapolis	
Chicago	Philadelphia	

Agencies in other principal cities

The MECHANICAL RAILWAY TIE



BETTER TRACKS
at Less Cost

Can Be Laid
by using
D.M. Ties all
the way!

Permanent—
Resilient—
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And the best and most careful method known so far is that of using D.M. Ties.

And these Ties have **Made Good** with a vengeance.

Dayton Mechanical Railway Ties are not only a **theoretical** solution of track troubles. They are the **practical** outcome of years of work and tests on track carrying both city and heavy, high-speed, interurban cars.

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THE DAYTON MECHANICAL TIE CO.
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Typical failure in solid casting at flangeway intersection in crossing.

Plain Crossings

Note the Crack

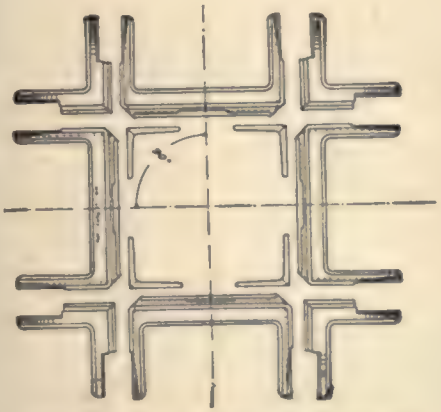
Your own experience with solid crossings tells you that fractures start where the photograph on the left shows. They are caused by lack of flexibility.

Balkwill Crossings

don't develop such cracks because scientifically designed joints are placed at the very spots where breaks formerly occurred.



Joints in Balkwill Articulated Cast Manganese Crossings are life savers. They positively prevent breakage at flangeway intersections, permitting 100% wear before renewal is necessary



Joints at the flangeway intersections of Balkwill Crossings positively eliminate breakage.

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MORE WEAR PER DOLLAR THAN ANY OTHER CROSSING YOU CAN BUY

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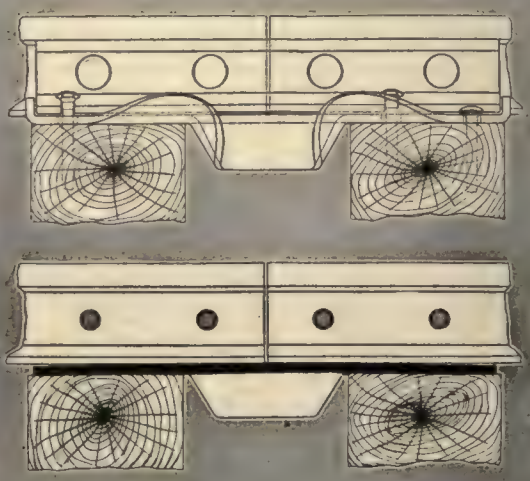
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Don't accept a so-called substitute, as there is none

The Balkwill Manganese Crossing Co.

506 Williamson Building, Cleveland, Ohio

Don't overlook this feature of

Abbott Rail-Joint Plates



THAT slight camber (exaggerated in the sketch) makes the rail ends bear first and bring the joint plate into action. Then as the wheel load approaches closer, the joint plate yields just enough to come into full flat bearing with the rail base and gives the weak part of the joint the entire support of the two joint ties.

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It provides a base support to the rail ends without clamping the flanges or making the joint too rigid, and leaves perfect freedom for wave motion of the rails.

Tests on Abbott-Plated track have shown perfect alignment and smooth-running track surface after five years of service.

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The ABBOTT RAIL JOINT PLATE



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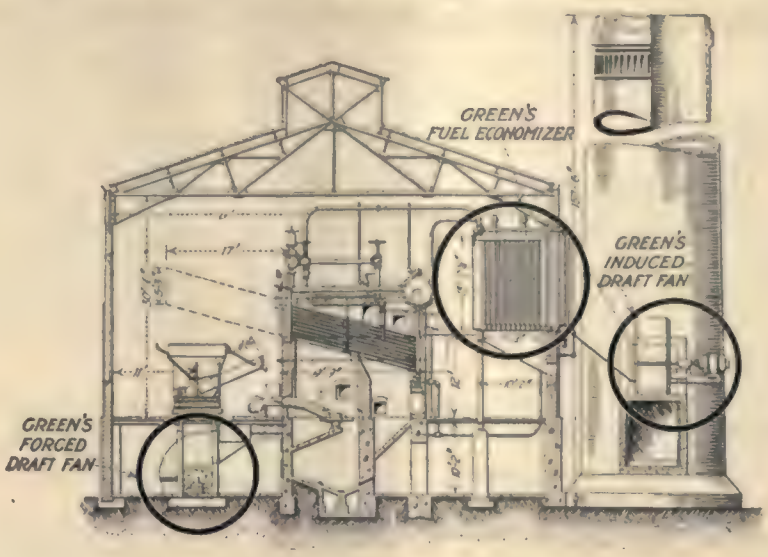


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In this notable plant, designed and built by the E. W. Clark Management Corporation, (Mr. Louis R. Lee, Chief Mechanical Engineer)

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were selected because of their established efficiency and have already proved to be a vital factor in maintaining high fuel economy.

Four of the eight economizers which will ultimately be installed are now in operation.

The gases from each battery of two 440-hp. boilers, capable of being operated up to 350 per cent. rating, are passed through one economizer, composed of 32 sections and having a total heating surface of 6300 square feet.

Water from one large feed water heater is introduced into the economizers under a pressure of 250 lb., and is raised to a final temperature of more than 325° F.

To insure a reliable supply of air for the stokers each battery of boilers is served by one Green's Radial Flow Forced Draft Fan.

Correct draft conditions for each battery of two boilers and one economizer are maintained by individual Green's Radial Flow Induced Draft Fans.



Green's Induced Draft Fans and flue connections from Green's Fuel Economizers.

Our engineers cooperated in the selection and arrangement of the above equipment. They are ready to render you a similar service.

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BEACON, N.Y.

Cut Ash Handling Costs

THE men who know—engineers of central stations and other large power plants—nearly always use the Skip Hoist for handling ashes. It has the lowest

Repair Cost because only the inexpensive skip bucket suffers abrasive wear.

Power Cost because there's nothing but the bucket and car to be moved, and no wasteful vacuum is needed.

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The BEAUMONT SKIP HOIST

It is simple, easy to operate and keep in repair, rugged and thoroughly dependable.

The Beaumont Skip Hoist is fully described in a special booklet, No. 32, sent on request.

For 25 years we have made a specialty of designing and installing complete coal and ash handling equipments under one contract. Some of the largest power users in the East are our customers.

Catalogue 33, just issued, shows some of our coal and ash handling installations.

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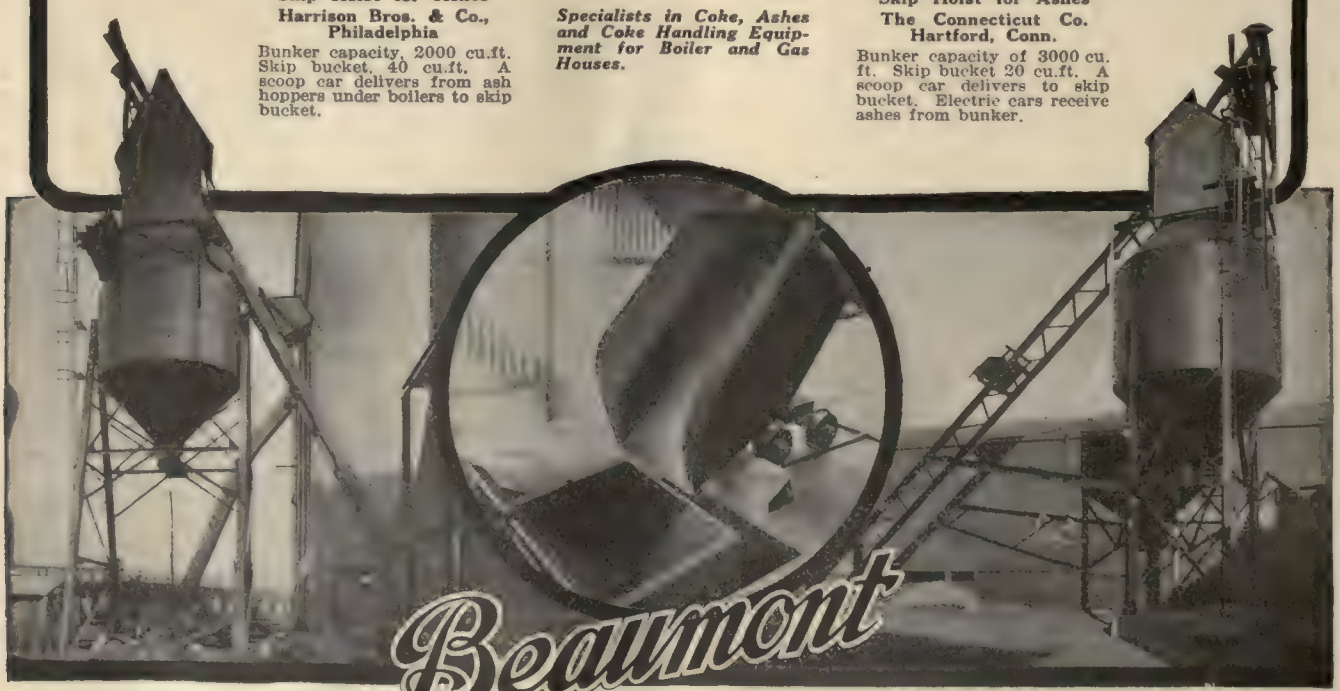
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Skip Hoist for Ashes
Harrison Bros. & Co., Philadelphia
Bunker capacity, 2000 cu.ft. Skip bucket, 40 cu.ft. A scoop car delivers from ash hoppers under boilers to skip bucket.

Specialists in Coke, Ashes and Coke Handling Equipment for Boiler and Gas Houses.

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Skip Hoist for Ashes
The Connecticut Co. Hartford, Conn.
Bunker capacity of 3000 cu. ft. Skip bucket 20 cu.ft. A scoop car delivers to skip bucket. Electric cars receive ashes from bunker.



ONE CONTRACT—ONE RESPONSIBILITY



"I made it in 18— That's a new record for Jim to go after"

Exclaimed an Economy Metered Motorman enthusiastically, describing how

The Sangamo ECONOMY Meter helped him to save power

The ECONOMY Meter actually measures what the motorman is asked to save. It is an open face device, enabling the motorman to see his own record as easily as he can look at his watch.

The dial of the ECONOMY Meter shows the motorman just how much energy he uses.

He knows that by saving energy he saves money, and few men are wilfully wasteful.

Because the ECONOMY Meter measures what he is trying to save, the motorman can satisfy himself as to the most economical methods of operation. His interest is held and he does save. These fundamentals underlie the success of the ECONOMY Meter.

The ECONOMY Meter promotes more economical use of energy in car operation. It is easily installed by connecting in series with the car motors. It displays the car motor energy consumption on cyclometer dials like a fare register. These readings are the basis for checking the performance of motormen. Comparison of records induces sustained effort to excel.

Thus energy is saved.

METER THE ENERGY
That's What You Want To Save



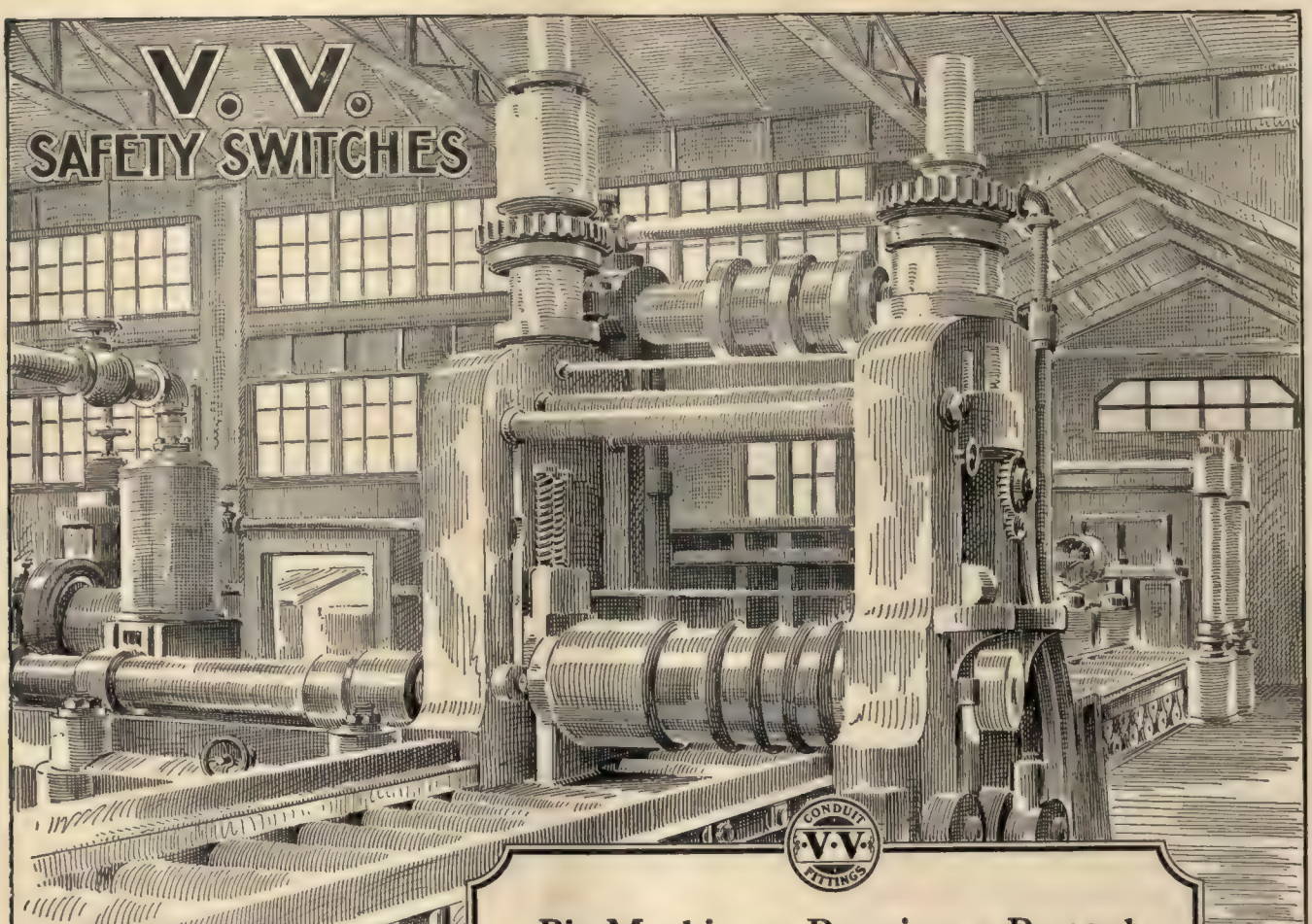
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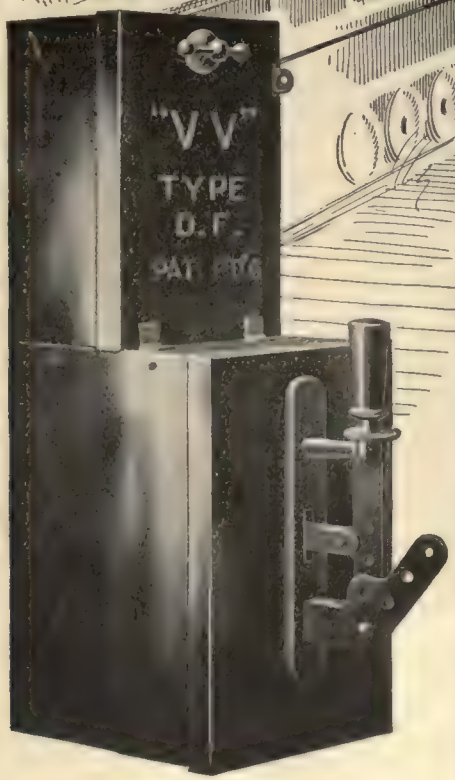
ECONOMY ELECTRIC DEVICES COMPANY

L. E. Gould, Pres.

Exclusive Sales Agent **Sangamo Economy Railway Meter**

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Big Machinery Requires a Rugged V. V. Safety Switch Equipment

Think, what tremendous heavy loads are carried by the various parts of big machines in large plants and what each part must do to stand the heavy strains and stresses in the daily operation. Safety Switches for these massive machines must be equally rugged for the work of which they are part, and the "V.V." Type "D. F." SAFETY SWITCH EQUIPMENTS are absolutely essential for the constant operation of these big machines.

Their Quick Make and Quick Break action, their exclusive safety features, their rugged construction and durability give stability and protection and insure against weaknesses natural in ordinary switches. Plenty of room is allowed for wiring and making connection, and all working parts are accessible for inspection at any time. These V. V. Safety Switches are made for 250, 500 and 600 volt work and in 30 to 1000 amperes capacities and complete information is given in our Bulletin No. 20 A, which will be sent free upon request.

Your plant needs these heavy duty safety switches.

V. V. FITTINGS COMPANY

PHILADELPHIA, PA.

NEW YORK **CHICAGO**



National Pneumatic Door and Step Control

on practically all Safety Cars



Scores and scores of live electric railways are now using light-weight Safety Cars of the type illustrated.

As these cars are run with a single operator, quick and easy movement of all mechanism is important.

Hence the popularity of the famous automatic door and step control, brake and sander combination of the Safety Car Devices Company, which combination includes **National Pneumatic** door engines as a regular feature.



National Pneumatic Company
50 Church Street, New York
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Tests of Time Only Prove the Superiority of

Irvington Black Varnished Cambric

for taping cable leads and rewinding coils indoors and out, in the power plant, on line and track. From generator coils to car motor, from cable to track switch under the severest tests of voltage, heat and moisture. Irvington Insulating products show their superiority.

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IRVINGTON VARNISH & INSULATOR CO.

Irvington, New Jersey.

Now Doubly Effective



Makes Record of Use of Power

Makes Record of Use of Brakes

The Arthur Power-Saving Recorder

The use of *The Arthur Power-Saving Recorder* on more than 1200 cars has been accompanied by a steady reduction in amount of power used by those cars.

The Arthur Recorders which aided so powerfully in securing this reduced consumption accomplished the result by recording the operation of the air brake only.

Without sacrificing a particle of the value of recording brake operation Arthur Recorders as now made and installed also show a record of the operation of the controller in addition to the recording of brake operation.

With this added feature the Arthur Recorder makes it possible to accurately measure and definitely record the precise degree of skill and care which the motorman uses in the operation of his car.

Such a record forms the best foundation for safe operation and power conservation.

We have a booklet that tells all about it and will gladly furnish copy of it on request.

The Arthur Power-Saving Recorder Co.
Second National Bank Building, New Haven, Conn.

ECONOMY

(*A Frugal and Judicious Use of Money*)

Never before have we been called upon to watch the dollars so closely as now.

Little economies make big savings.

Users of N-L electric battery taillights know why they are more economical than oil taillights.

Oil taillights are unreliable. They blow out easily. The nuisance of furnishing new burners and wicks is one of great annoyance and cost. Many oil taillights have disappeared for this reason.

N-L battery taillights give their users evidence of longevity, dependability and fundamental economy. The reasons are:

1. Economy of maintenance and operation.
2. Cleanliness—no smoke or oil.
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4. Always ready for immediate use.
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7. Employees like to use them.

May we send more information?

THE NICHOLS-LINTERN COMPANY
CLEVELAND, OHIO, U. S. A.



The men who Built Birmingham, Ala.— Dr. H. M. CALDWELL and B. F. RODEN.

The Cholera Epidemic of 1873

struck Birmingham, the two-year-old, with devastating force, and it was only due to the remarkable tenacity and diligence of the two men pictured above that the entire community was not stampeded into full flight.

The great iron and coal deposits of the district had drawn towards it a number of enterprising men who firmly believed in the statement of Abram S. Hewitt, of New York, who said: "The fact is plain. Alabama is to be the iron manufacturing center of the habitable globe." The city was barely 8 years old when the Birmingham Street Railway Co. was organized with $40,000 capital stock. Horses and mules supplied the motive power at first, but electrification took place within a decade of the laying of the first rails.

Birmingham has today 186.5 miles of electric railway track or nearly a mile and a half for every thousand inhabitants, and its thoroughly comprehensive trolley car system, with the constant installation of the most up-to-date equipment and methods, has been a big factor in the growth of this industrial young giant among American communities.

Galena Oils

and Galena Service began the development of scientific lubrication methods just a year or two before Birmingham got "on the map." Like Birmingham they had to go through many early hardships and also like Birmingham they won through these hard conditions by reason of the ability and faith and vision of the men behind them.

Galena-Signal Oil Co.

Franklin, Pa.



A SERVICE
that really Serves

A G-E Renewal Parts catalog is never shelved. It stays at the railway man's elbow. He knows he can depend upon it because it is made especially for his Company.

In ordering renewal parts for his car equipments this catalog simplifies the operation for him and saves hours of his time.

When new equipments are purchased, additional sheets are sent for insertion in the loose-leaved binder. A simple system of indexing makes it an easy task at all times to select the exact part required.

If you have never received one of these catalogs you are missing a valuable service. Ask now to have one made up for your lines.

General Electric Company

General Office: Schenectady, N. Y.

Sales Offices in All Large Cities

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 New York, Saturday, June 15, 1918 *Number* 24

Let's Confine Attention to Essential Transportation Service

THE chartered car is a good thing in times of peace when a surplus of men and rolling stock is available. It is likely to prove a bad proposition this summer in those communities where the war has brought the need for applying every car-mile possible to war plant transportation. In ordinary times, for example, the chartered car may earn at least as much money as cars in regular service, but this would hardly be the case where properties are clamoring for cars, more cars and still more cars. Thus self-interest and patriotism combine to shelve this class of special service for the time being.

Closely related to the chartered car is park service. Usually the bulk of this is the transportation of women and children during the afternoon at what is really a non-profitable rate of fare since so many children ride free, at half rates or even where no general reduction is customary for pleasure travel. If the runs are so long that the return is made during the evening peak, this class of service becomes a positive detriment to the needs of war-work transportation and ought to be curtailed if not utterly eliminated. One might even go a step further by discouraging excessive pleasure riding on Sundays if it is to private resorts where strong drink is sold, for this means a strain on the patience of overworked car men. In these times with jobs so easy to get, the shrewd operator will not encourage the kind of travel that makes motormen and conductors too tired to show up the following Monday. He will realize that it is both better business and better patriotism to give the best possible regular service, leaving the cultivation of chartered car, park or other auxiliary service to post-bellum days. His task now is to get the biggest possible war-service mileage per car and per man, using any free time for the repair of the one and the recuperation of the other.

Every City Should Adopt the Skip Stop and Save Coal for Next Winter

TO THE AVERAGE citizen, the arrival of warm weather has settled the fuel question, at least so far as any present worry about it is concerned. Actually, this is just the time when there should be great savings because they will count more towards relieving next winter's shortage if made now than later. The National Fuel Administration realizes this, as can be seen from its recent announcement that between 50,000,000 and 60,000,000 tons must be saved by the nation at large if the householders and industrial plants in this country are not to suffer during the coming winter. The only way in which this shortage can be overcome is through the co-operation of every coal user in the country.

Electric railways, as large power users, have an important duty to perform in this campaign. Through the introduction of the skip stop alone the Fuel Administration expects that a saving can be made of 1,000,000 tons of the fifty million which will be required by the nation to get through next winter comfortably. Some fifteen cities were mentioned in our issue of last week as having introduced the skip stop, but this number is insignificant compared with the possibilities, and every company which has not done so ought to take this matter up promptly with its city authorities. In so doing it should have the hearty assistance of every non-war industry in its community, because if there should be any deficiency in fuel next winter it will come out of the quota of these industries and not out of the supply to which the electric railway is entitled. There should surely be an incentive also to the average citizen to support a movement like this which has the double purpose of giving him better transportation this summer and helping to keep his home warm next winter. The local fuel administrator can be counted upon to assist in such a campaign because of the prominence placed by the National Board upon this particular economy. Here is a case where everyone gains.

How Can Boiler Excess Air Be Controlled?

IN THE last mechanical issue, that for May 18, Hartley LeH. Smith, in his article on the boiler plant, mentioned some boiler tests which showed that, regardless of other variables, for a given flue draft the least coal consumption produced the best economy. The tests were fifteen in number and they were run with an overfeed stoker and semi-bituminous coal. The results suggest that there are certain aspects of power generation by combustion of coal which are still not thoroughly understood. Even some men ostensibly acquainted rather intimately with the coal furnace problem do not quite appreciate these. Witness this question. Suppose that a boiler test has been run and has shown about rated capacity but excess of air, say 90 per cent above theoretical requirements. Suppose that it is desired to repeat the test with the stipulation that the steaming rate shall be about the same as in the first test, but that the excess air shall be but about 60 per cent above theoretical requirements. Suppose the boiler to have a furnace with hand-fired grate and forced draft. Now the question is: How can substantially unchanged steaming rate together with reduced excess air be insured?

To say that the answer is simple will not be enough. It isn't simple. The Electric Railway Journal invites expression of opinion in the matter. We may hint that the crux of the problem is that excess air is not one of the independent variables. It is, in fact, dis-

tinctly a dependent variable. The forced-air pressure, the rate of coal firing, the thickness of fire and the flue draft are independent variables. The steaming rate is another dependent variable; it is the capacity of boiler and furnace. Excess air is certainly related to the efficiency. But how can one with confidence so alter the independent variables shown by one test not to be most suitable so that steaming rate may be held approximately constant while the excess air is altered to suit? The subject is open for discussion.

Keeping the Substation in Operation in Wartime

THE labor shortage has hit the electric railway substation a hard blow. As a rule railway operators are young men much needed by Uncle Sam, either as soldiers or workers in manufacturing plants engaged in essential war work. They must be replaced either by older men or by women, unless the substations can be made automatic. If automatic apparatus could be secured quickly, no doubt the installation of this type of control equipment would be many times more rapid than it is. Even with deliveries as slow as at present it would be well to plan the installation of such equipment as soon as it can be obtained, which means ordering at once. In the meantime, and in those cases where the automatic seems not immediately applicable, what is to be done for substation attendance?

The first resource is naturally the ranks of men not eligible for war duty. Such men are apt to be steady and dependable, but lacking in alertness and resourcefulness, that is to say "nerve." Possibly their virtues and defects about balance. They are, however, accustomed to wages higher than are usually allotted to the substation operator. Somehow these men and the railways must get together on a compromise. They will have to be paid a little more but must realize their shortcomings with respect to this particular class of work.

Young women ought to make good operators and on the day shifts there could be no possible objection to their employment. Occasionally there are heavy tasks to be done, such as pulling large direct-current feeder switches, but this heavy work is of short duration. The operator must have the physical strength for such tasks, although great endurance need not invariably accompany it. If women should prove otherwise capable, eventually air or electric power could be applied to heavy switch opening and closing. This matter of women employment must be tried out before we can definitely answer the question "Are women suited to substation operation?"

An ideal arrangement for this difficult situation in some instances would seem to be to make the running of the substation a family affair by turning it over to a man and his wife. They could employ a helper or utilize a young fellow in the family. Their home should be a part of the substation. The work could be divided so that the man could be on duty at times of peak load and could be called in case of any emergency. The woman could take the "off" hours and the helper could relieve either or both as arranged. The amount which could be paid for this service would be attractive to many who might be able to save house rent, and as a war measure at least the plan would be justifiable.

Some Electric Railway Problems the War Labor Board Must Solve

DISCUSSION before the National War Labor Board in Chicago recently when the wage controversies of the Detroit and Cleveland companies were being presented brought out some interesting features of the labor situation as it affects the electric railway industry in the United States during war times. Coming so close upon the award of larger pay to steam road employees and the increase in freight and passenger rates to meet the new costs, the points of difference must have appealed strongly to the members of the board because here were cases in which, even though the demands of the men were just, the financial inability of the companies to meet them was apparent.

Surely, here is a problem for the national authorities if, as Chairman Walsh said, the employees are to receive what is due them, no matter what readjustments or additional legislation may be required to accomplish this result. New precedents are being established every day. Perhaps, then, we may look with confidence to this new board to point a way out of the difficulties surrounding the electric railways in their need for increased revenues.

The employees were not placed in an enviable position by the exhibit of the Detroit company which showed that they do not accept the opportunity to earn the maximum pay. In the month of March, 1918, 59 per cent of the trainmen worked twenty-six or more days, according to this evidence. Those who put in full time drew an amount in wages which should have enabled them to meet the cost of living. The conclusion is plain that those who did not use their opportunity to the utmost were not showing a proper spirit to meet industrial conditions during a time when there is a shortage of labor.

"Hours of service" was another question which engaged the attention of the board, and Chairman Taft evidenced his familiarity with urban railway conditions when he suggested that public demands for service during peak hours might make it necessary to arrange schedules on a basis which gave a wide range of "outside hours" for men working on the cars. The Massachusetts nine-in-eleven-hours law passed several years ago did not correct these conditions and only resulted in an arrangement by which the men were paid extra for hours of duty outside the maximum in the statute.

The Railroad Wage Commission in its recent report met a similar situation fairly when it said: "This, moreover, is not the time, in the judgment of the commission, to make experiments which might lessen the output of that commodity which railroad men produce—tons of freight hauled and numbers of passengers carried. The one thing now imperative is volume of and speed in railroad output." The commission also refused to penalize the employers for too long a work day, "at a time when urgent and serious necessity compels sacrifice from all." The electric railway situation calls for treatment equally as fair, because not only are these companies doing their share to speed up war work, but the circumstances under which they operate cannot be met by shortening the working day of the employees.

A question asked by Chairman Taft during the hearing indicated his opinion that electric railway work is attractive, and one of the reasons mentioned as

making such employment inviting is its steadiness. Conductors and motormen who are being lured to other occupations by offers of higher pay should keep this point in mind. The average electric railway is giving fair wages to its employees, and if it cannot compete with the extremely high pay offered in certain war industries it is usually due to financial inability. The reasons for this handicap are apparent to all fair-minded persons, most of all to the employees who continue to collect the same unit of fare which their predecessors collected for several generations. There is only one way out of the dilemma and that is to obtain increased revenue. Organized labor can do its share to impress this on fare-regulating agencies, and meanwhile it should be patient in helping the employing companies to struggle along.

The capable members of the War Labor Board will undoubtedly recognize in these conditions a situation different from that of any other dispute which may come under their jurisdiction. Federal Judge Alschuler recently granted advanced wages to thousands of stock yards employees, and in doing so he made the point that "we are not here met with the ofttimes embarrassing and influential contention that the profits of the industry will not warrant the demanded hours or wages." With the electric railways this contention is "embarrassing and influential" and should have considerable weight with any board called on to add to the burdens of a business which is limited in its prospects of increased revenue. The moral influence of the War Labor Board should go a long way toward overcoming any barriers which may stand in the way of meeting the just demands for improved service, fair wages and adequate return on investment.

Country Needs More Commissioners Like Mr. Straus

OSCAR S. STRAUS, chairman of the Public Service Commission for the First District of New York, has tendered his resignation to Governor Whitman and asked to be released from active duty not later than July 1. At the time of his appointment to fill the vacancy caused by the removal of Edward E. McCall, Mr. Straus refused to accept the post for a full five-year term. Now he desires to lay down the duties for he considers that the major part of the work for which he was appointed has been finished, and he feels that his experience better fits him for other work of importance in this hour of national need.

It must be a source of great gratification to Mr. Straus to be able to look back upon an active life of more than three-score years and seven, with its large amount of important work in the service of the public. Mr. Straus is a conscientious and honest worker and a broad-minded man, the kind needed at the head of regulative bodies. He has won the respect and loyalty not only of his associates and co-workers, but also of the public and the officials of the utilities under his jurisdiction. Governor Whitman showed great sagacity in appointing such a capable man to such a responsible position. Let us hope that he will show equally as good judgment in choosing a successor.

Now more than ever, regulation demands men of high type. The preservation of utilities from the danger of increased costs and fixed rates is a national necessity. The successful prosecution of the war and the general welfare of the people demand the maintenance of the utility industry at the maximum of efficiency. Regulation of utilities to accomplish this end requires men of judgment, men of courage and men of vision. In New York, to a greater degree than elsewhere, such men are needed, for the defects which the courts have found in the regulatory law must be overcome by public education, and no leaders have a greater responsibility for teaching to the public the requirements of justice to utilities than do the members of commissions.

The utility situation in New York State is not of local importance; it has a national bearing. The man who can take up the work where Mr. Straus finds it necessary to stop and can carry it on with success through the coming critical reconstruction period will be serving his country nobly.

Mechanical Engineers Make Plea for Cleaner Coal

NOTABLE among the features of the spring meeting of the American Society of Mechanical Engineers held at Worcester, Mass., June 4 to 7, were the large attendance at the fuel conservation session and the volume of papers and discussion, necessitating a second session in the afternoon. Conspicuous was the emphatic and repeated expression of opinion on the part of fuel consumers that the Fuel Administration should promptly and energetically mete out to the coal producers such sound trouncings as would revive their appreciation of the legitimate longing of coal consumers for coal sufficiently clean to permit the possibility of its burning. The meeting even went to the length of passing a resolution to this effect. Active interest was also aroused in the burning of anthracite screenings mixed with bituminous coal on underfeed stokers, and promising accounts of experience in this line were given. The economic limit was sharply defined as 30 to 35 per cent of anthracite screenings with the greatest possible homogeneity of mixture.

Equally important was the call for engineers to man the forces of the Fuel Administration in its great program of economy in the use of coal. The strong statement was made that every combustion expert in the country will be needed in active service to this end.

Technically there was no feature of the sessions devoted to coal approaching the interest and significance of Henry Kreisinger's address (cut short in presentation as were all others by the inexorably efficient chairman) on the inherent nature of coal combustion. He made the statement that more than 7 lb. of air per pound of coal cannot be made to flow through a fuel bed provided it has an unbroken surface. He remarked that possibly this was news to some of his hearers, and the discussion after the meeting among groups of members showed that this was so. Mr. Kreisinger added to his long list of services to combustion engineers by pointing out the inevitability of large air supply above the fire. This may be provided properly by the furnace designers, or the fire itself will provide it by breaking into holes if the furnace design is such as not to satisfy the fire's thirst for air above its surface. Mr. Kreisinger is an expert in coal combustion of great originality, and the time and place of announcing the latest results of his researches were well chosen.

Concrete Poles Are in the Process of Evolution

They Possess Certain Intrinsic Virtues But Should Not Be Designed in Imitation of Wood Poles—The Subject Should Be Thoroughly Investigated to Develop the Most Practical and Durable Concrete Pole

By Charles Rufus Harte
Construction Engineer
The Connecticut Company, New Haven, Conn.

THE possibilities of using concrete as a pole material were first tried out in 1856 in connection with the Panama Railroad, the insects of the Isthmus having proved to be too much for wood. The poles were short and stout, having a length of but 12 ft., tops from 6 to 8 in. in diameter, and butts from 12 to 15 in. across. The iron crossarms were fastened to the poles by means of clamping bands.

The first poles were of plain concrete. It would seem that with the dimensions used they should have served well in a sleet-free section, but they proved not to be satisfactory. Whether the concrete was poor, or monkeys used the wires too freely—a source of serious trouble in the tropics—or from some other cause, the poles were very shortly replaced by others reinforced with a wood core 3 in. square. These behaved but little better than the solid concrete poles, for the core swelled and split the casing of concrete.

From the relative dimensions of the parts of these poles it is quite certain that both the wood and the concrete were expected to take parts of the load. In the case of the concrete-covered poles used at a much later date in Switzerland the wood was full size and the thin concrete shell served merely for protection. Incidentally there seems to be some difference of opinion as to the success of the scheme.



"Made It Myself," Said the Overhead Engineer, "Can You Beat It?"

Steel Reinforcement Made the Concrete Pole Possible

Not until about 1895 was steel used as reinforcement, when concrete poles so reinforced were tried out both here and abroad. Although the experimenters were loud in their praises of the products, it was some time before there were any worth-while results. This was doubtless due to failure to appreciate the faults of the new construction until the poles were made, and a bad attack of "cold feet" on the part of the enthusiasts immediately thereafter.

A few, however, stuck to the problem, and by 1910 the reinforced concrete pole had become a reasonably practicable structure. Credit for this result is due particularly to the Concrete Pole Company of St. Catherines, Ont., which built several hundred for transmission lines in the Welland Canal district; to George A. Cellar, superintendent of telegraph Pennsylvania Lines west of Pittsburgh, one of the earliest in the field; to the United Traction Company, Albany, N. Y.; and to several others. Since 1910 very satisfactory results have been secured, although the development has been chiefly local. A few companies, notably the Cleveland Railway; the Fort Wayne & Wabash Valley Traction Company; the Marseilles Land & Water Company, Marseilles, Ill., the New York State Railways; the Oklahoma Gas & Electric Company and the Welland Canal district companies have used very considerable numbers, while but few other companies seem to have employed concrete poles at all.

The life of a reinforced concrete pole depends on several factors. The concrete itself is practically everlasting as regards decay or corrosion, but it may fail through a mechanical injury. The reinforcement cannot rust so long as it is sealed in the concrete and it is also thus protected from electrolysis. But injury to the covering concrete may expose the metal and permit its destruction by corrosion, while under favorable conditions for such action electrolysis may be set up. The resulting expansion of the steel as it corrodes will split off the protecting material and allow the weather also to take a hand in the destruction.

It was feared by many that moisture would work into the metal and rust it; that frost would spall off the concrete from the reinforcement, leaving it unprotected, and that lightning would shatter the poles, but none of these fears has been realized. Where the concrete has cracked, either from contraction when setting or from mechanical stress, there have been some instances of corrosion as would naturally be expected under the circumstances. Lighting, however, in the rare instances when it has been known to strike, has only slightly chipped the concrete, leaving the pole practically as good as new. In the event of a grass fire, or of a conductor grounding on the pole, there is far less liability to trouble than with wood. A hot fire or a heavy ground may cause spalling of the concrete, but if the injury is not too long neglected the pole can be patched and made as good as new. With a wood pole any loss of material can be made good only by complete replacement, and it is astonishing how small a bunch of dry grass will serve to set a wood pole going.

In case of failure, reinforced concrete poles do not break off. Wood poles have greater flexibility, and this often relieves a severe load by increasing the sag of the pulling span; but when the ultimate strength is

reached they snap, dropping everything. A reinforced concrete pole, because of its greater stiffness, comes more quickly to serious "distress," but although it may be wrecked beyond repair it will only bend. Even if it lets part of the overhead touch the ground it almost invariably holds up part and so keeps the attachments in fairly good shape.

Concrete Poles Can Be Made Attractive in Appearance

Properly treated, a concrete pole is of pleasing appearance, but unfortunately, with a very little neglect in the making it looks very unsightly. Some designs are quite elaborate, as for example the combined light and trolley pole of the Municipal Railway of San Francisco. On the other hand, nothing could be finer than the severe simplicity of the square pole of the same company or that of the Pennsylvania Railroad's Jersey meadows telegraph line, unless it is the standard octagonal pole of the New York State Railways, which latter is not only attractive and substantial but actually costs but little more than the corresponding size in wood.



SPAN WIRE CONSTRUCTION WITH CONCRETE POLES, NEW YORK STATE RAILWAYS, ROCHESTER LINES. THIS COMPANY HAS MANY SUCH POLES IN USE

In several instances where wood poles had been ordered off the streets of certain municipalities the authorities have been so pleased with the appearance of concrete poles that they have permitted their use instead, at a cost much less than that of steel poles, and far less than that of underground construction.

Some Reasons for the Comparative Unpopularity of Concrete Poles

As against these advantages of long life, support of attachments in case of failure of the pole, resistance to fire and good appearance there are several disadvantages inherent in the concrete pole. Good results in making concrete poles require good forms and skilled labor, and unless the number made is large the cost per pole is very apt to be high even for the very simple types. The poles are heavy at best, and require special care and extra labor for handling and erecting, which further adds to the cost, while if molded with holes or gains for attachments, later changes are not readily made and are apt to be costly, and if such provision is not made it is equally difficult to make any attachment at all. These facts, which are particularly evident when a company first begins to make and use concrete poles, are undoubtedly responsible for the dislike by many companies and the consequent failure to use what is quite likely to be one of the important pole materials of the near future.

The theory of the reinforced concrete poles is very simple. Concrete, with permanence, ease of molding and comparative cheapness, lacks only tensile strength to be an excellent pole material. Steel has very high tensile strength and needs only to be properly combined with the concrete to give the desired results.

The practical application, however, is not quite so simple, for if the steel is not properly proportioned to the concrete, and correctly arranged within the concrete body, the strains are not properly distributed between the two and the pole will either be weak or uneconomical. The forms must be sufficiently strong to remain true and yet must allow proper access to the concrete for working so as to secure good surface and freedom from cavities. Furthermore, the reinforcement must be maintained in correct position while the concrete is being placed.

There are many discussions of the theory of pole design. One of the best of these appeared in the 1916 report of the power distribution committee of the American Electric Railway Engineering Association. The

design and practice developed for his company by Carl L. Cadle, chief engineer New York State Railways, Rochester lines, and described in the reports of the same committee for 1915 and 1916, seems easily to be the best of the unpatented methods that have as yet been described.

Hollow as Well as Solid Poles Are Available

Of the patented methods there are several which have had practical test. One of the earliest developed is the "Siegwart," in which the concrete with its reinforcement is plastered on a rotating form. This with the aid of a canvas belt wound spirally outside compresses and forms a hollow round pole. This construction is said to be very satisfactory. Another method, that of Otto and Schlosser, involves the use of centrifugal force. In a hollow form are placed the reinforcement, tied into shape and the concrete form is then closed and rotated at high speed, centrifugal force forcing the concrete firmly against the form. This type of pole is also said to be very satisfactory, but like the Siegwart its use is confined largely if not entirely to Europe.

In this country the Jones process employs a series of compression rolls, an inner core and a canvas belt. The reinforcement is woven to shape in a special machine and put over the inner core, and the combination is laid in the canvas belt between the spread rolls. The proper amount of concrete is then dropped in, the rolls are closed to position and the forming is begun. The canvas draws first in one direction, then back, the length being such as to give about two and a half turns to the pole. Whether this pole has been used to any appreciable extent the writer does not know.

Obviously, after completion the hollow pole is superior to solid poles in the smaller quantity of concrete required and the consequent lightness. But the machine-made types require costly apparatus, and for hand forming the complications of a core have seemed to many experimenters too much of a good thing. F. H. Tidnam of the Oklahoma Gas & Electric Company, has, however, developed a very satisfactory hexagonal hollow-type pole, which is the standard of this company for important lines. This pole is formed in a metal mold, and the collapsible core is removed as soon as the concrete has taken its initial set.

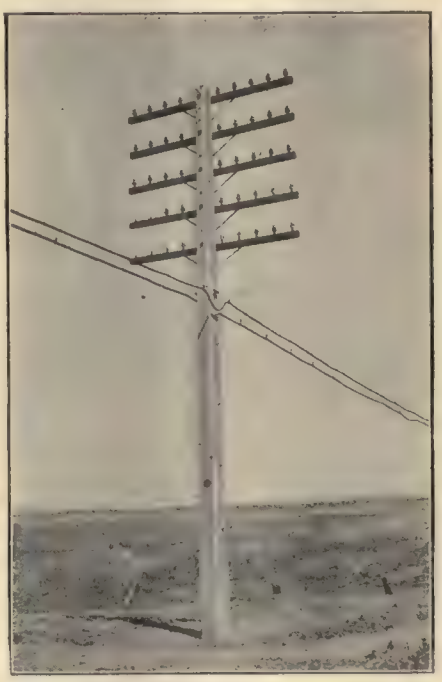
Concrete Poles Cost More Than Wood

The concrete pole to-day is in a very peculiar position. It offers many advantages at any time, but the present shortage of chestnut and the growing importance of other pole woods for purposes which do not allow of substitutes makes its employment particularly attractive. Unfortunately, however, the tendency in regard to its development by the comparatively few who have really gone into the subject in earnest has been to substitute reinforced concrete for wood in substantially the same dimensions rather than to develop a reinforced-concrete support of the most efficient type.

At present, a 30-ft. solid pole, with a breaking strength of about 2500 lb., when it is set 6 ft. in the ground and the load is applied 2 ft. below the top, weighs from 2500 lb. to 3500 lb. The cost ranges from $17.15 in actual cost in quantity, up to $125, the latter figure being a recent bid on a lot of fifty poles exactly like those for which the lower price was paid. Handling, hauling and setting would be about twice as great as for wood poles of equivalent strength. The latter would have to have a ground-line circumference of 43 in. and would be cut down from Class A 35-ft., or Class B 40-ft. poles. Recent quotations on such poles, f. o. b. the same points as the concrete poles



Combined Light and Trolley Pole, Municipal Railway of San Francisco



Pennsylvania Railroad's Telegraph Line Pole on Jersey Meadows



Square Trolley Pole, Municipal Railway of San Francisco

SAMPLES OF SATISFACTORY DESIGNS OF CONCRETE POLES

referred to, were $8 each for chestnut, and $16.35 each for Western red cedar, which would weigh about 1000 lb. and 600 lb. respectively.

Hollow-type concrete poles ought to have a weight and a cost not over two-thirds of the corresponding figures for the solid pole of equal capacity, but while the available information indicates such results the writer has not seen sufficiently definite figures to warrant a specific statement.

Concrete Pole Research Is Greatly Needed Now

The entire subject of concrete pole design, manufacture and use is of the greatest importance. It ought to have a most thorough investigation. For anyone to build one or two concrete poles with the expectation of so solving all the questions out of hand is, however, simply a waste of time and money.

Good reinforced concrete poles were built about 1903, and the number has steadily if not rapidly increased ever since. Moreover, many of these are serving their purpose at least fairly well. But the important question is whether or not the work they are doing could not be done just as well by poles of simpler design.

Mathematics and laboratory experiments will point the way, but the determination of how nearly the perfect design can be approached in every-day practice, and just how far short of the performance of the perfect pole the practical article will fall as a result of that difference, can only be found by full size tests. Some of these must be to destruction, and on a sufficiently large number of specimens to eliminate the effect of unusual conditions which might indicate very high or very low values for a single pole.

It is to be hoped that present conditions, which are demanding every possible measure of efficiency, will lead to such thorough investigation of this subject as will develop the practical and economical concrete pole.

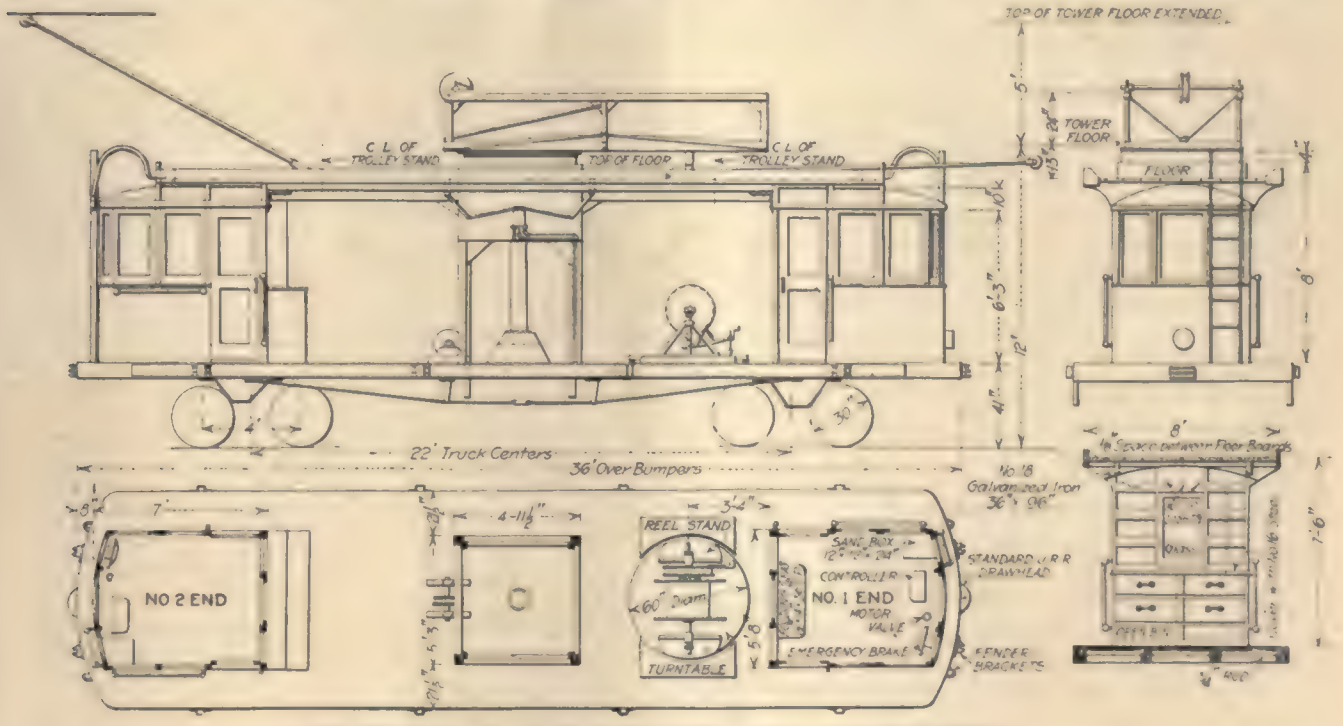
Special Features of San Francisco Tower Car

Pneumatic Hoist Raises Tower Full Length in Eight Seconds and Reel Mount Permits Wire to Be Strung in Either Direction

BY S. L. FOSTER
Chief Electrician, United Railroads of San Francisco

THE United Railroads of San Francisco has developed and for several years has been successfully using a four-motor, high-speed tower car whose equipment involves interesting features for rapid and efficient overhead line work. This car has a closed cab at each end to protect the men in transit from the occasional winds in summer and rains in winter. Otherwise it is open as is permissible in the mild climate prevailing in San Francisco, and so provides ready accessibility.

Besides the varied assortment of equipment usually found on tower cars, the two features most productive of labor saving are the pneumatic hoist for the tower and the turntable-supported, brake-equipped mount for the reel of trolley wire.



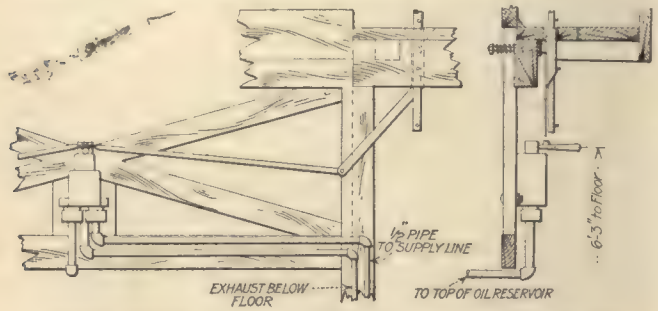
GENERAL ARRANGEMENT OF TOWER CAR, SAN FRANCISCO

The compressed air for the tower hoist is admitted above an oil reservoir communicating with the bottom of a single, central, 7-in. x 6-in. brass-ram cylinder. Any oil leakage occurring around the ram piston is provided for by a supplementary oil reservoir installed so that it may be periodically drained into the main tank. This leakage while appreciable at first soon became practically negligible.

The actuating device for this pneumatic oil hoist is an ordinary engineer's three-way valve situated in the center of one side of the tower frame 6 ft. 3 in. above the floor of the car. The valve is thus readily accessible to anyone on the main platform of the car. When all hands are aloft this air valve may be operated from the top of the tower, as the handle of the valve is connected

by two links to two hinged sockets at either end of the tower. Into either of these sockets a 6-ft. 10-in. cylindrical insulated staff can be inserted from the tower platform and the valve thus moved as desired.

To prevent possible injury to the removable slender staff by being struck with the swinging leaf of the tower



MECHANISM FOR OPERATING AIR VALVE FROM TOWER PLATFORM

these sockets are slotted for their full length and the staff is made adjustable by being provided with studs or pins along its length on one side at 1-ft. intervals thus permitting the staff to be operated or left set in the sockets at any height desired. It can thus be dropped so that its top is below the level of the swinging leaf and hauled up again when needed.

Flat steel springs are included in the arrangement of links between valve and socket so as always to restore the handle of the valve to the exact "holding" position after the man above has secured the action he desires.

in diameter. An adjustable band brake is keyed to the supporting shaft, the whole being readily removable by loosening one bolt.

When changing from an empty to a full reel, the turntable combination is given a quarter turn and the empty reel is lowered by the reel jack screws until its flanges rest on the floor of the turntable when it is rolled off the car to a reel storage platform.

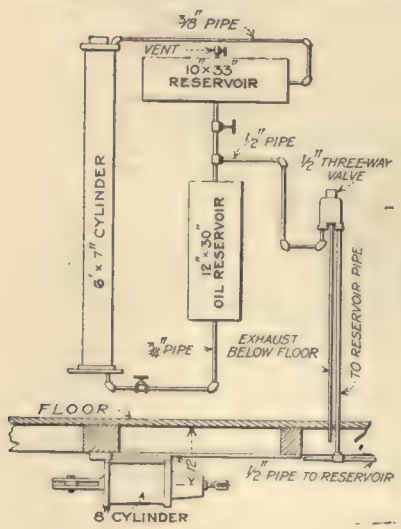
The shaft is then transferred from the empty to a full reel which is rolled into position on the turntable between the reel jacks and raised to its proper location. The combination is then given a quarter turn back and is ready for paying out the trolley wire.

This paying out requires no attention after the brake has once been set to give the exact amount of friction to secure the wire tension desired by the linemen on top.

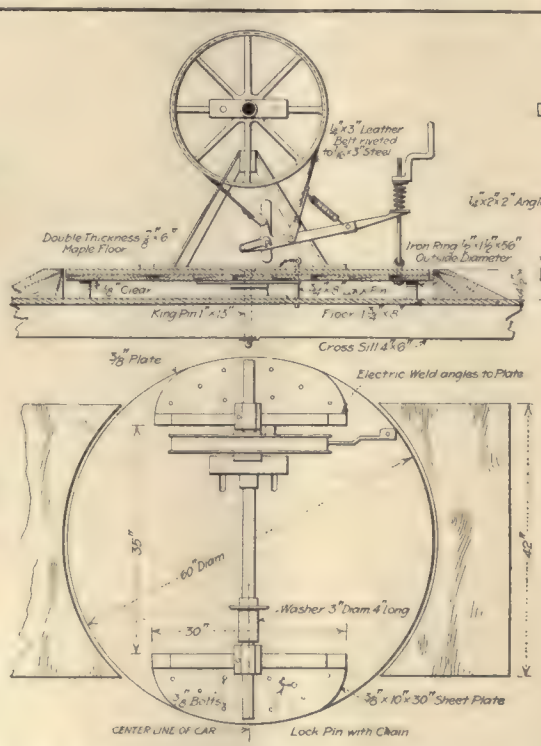
By means of this arrangement and a large wooden sheave just above the floor of the car on the opposite side of the tower, it is possible to string trolley wire out in either direction. The wire passes under the ram cylinder and then upward when being strung out over the reel mount end of the car roof. When being strung out over the opposite end of the car it passes directly upward from the reel to the tower platform.

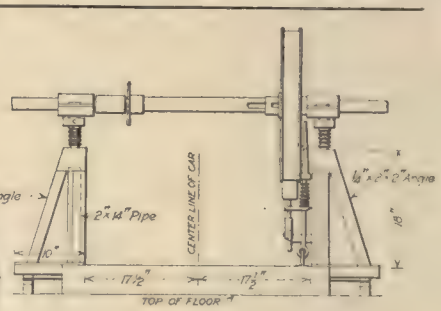
The reel jacks are bolted permanently to the turntable. The latter is held rigidly to the car floor by its center pin and the reel shaft is prevented from lifting out of the jacks by the bolted top caps of the shaft bearings on top of these jacks.

Permanent outside vertical ladders are provided at each end of the car for climbing to the roof from the



PNEUMATIC HOIST PIPING





TURNTABLE AND REEL MOUNTING

The tower can be raised its full height by this equipment in eight seconds. It remains practically rigid where set without further locking or chaining.

The reel of trolley wire is supported by a 2-in. steel shaft with ends resting in hinged bearings of two standard adjustable reel jacks. The complete apparatus is mounted on a circular ball-bearing turntable 5 ft.

floor. A hinged, collapsible pole jenny and a complete set of hole-digging and pole-raising tools are suspended from heavy hooks out of the way and yet within easy reach along the edge of the roof under the extension ladders. Other working conveniences are a bench vise, charcoal bin and forge on the floor, rows of material bins along and under the roof, drawers, hooks, etc.

Keeping Power Plant Oil in Good Condition

Oil Disintegrates in Service—After Wise Selection the Problem Is So to Treat the Oil that It Will Be Available Without Waste for Reuse

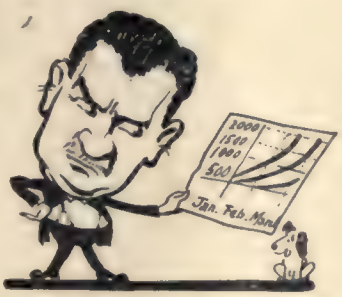
By Hartley LeH. Smith
Chief of Testing Bureau
Brooklyn Rapid Transit System

THE following discussion of oil in steam turbine power stations aims to bring forward for examination some of the aspects of turbine lubrication which among many engineers to-day are regarded as problematical. My hope is that a certain amount of discussion may result which, for myself as for others, will clear up in a measure some of the points on which many of us are seeking further light.

Oil Does Deteriorate in Service

It has become very common of late in the literature of turbine lubrication to find the frankest sort of reference to the formation of oxidation products in turbine oil which has circulated more or less continuously for a considerable time, whatever may be the particular type of circulation and oil filtration.

This frank reference to oil disintegration in continued service is rather recent. Not long ago the writer met oil salesmen who professed never even to have heard of such a thing. While confessing themselves entirely mystified as to the nature and cause of such action these salesmen were yet able to express entire confidence that their own oil would not disintegrate. And it is only a few years ago that some turbine designers were ready to let it appear that they at least looked a little askance at some oils and more favorably on others. Now the basis of their likes and dislikes appears to be that in one plant conditions more favorable to growth of oxidation or polymerization products threw the onus of blame upon the oil in use, rather than upon the local plant-operating conditions.



Careful Analysis Discloses Why So Much Oil Is Necessary

Of a truth all oils in continuous turbine lubrication service will form such oxidation products. What the operating engineers want to know are the facts regarding the specific liability of a given oil so to deteriorate, and the plant equipment and operating features which stimulate or alleviate the inherent tendency of the oil to further such growth within itself.

Oils Become Acid as They Deteriorate

The oxidation or polymerization products always produce an acid condition in the oil, in fact such products are measured quantitatively in terms of some relatively simple organic acid. Perhaps the acid most commonly employed for this reference purpose is oleic acid. And yet oil has sometimes been condemned as improperly refined because after long service it had this distinct acid reaction.

Naturally when the acidity of the oil in service has reached considerable proportions there is danger that the oil will do what any acid circulating in a turbine would do, namely, cause corrosion. Before discussing this matter, however, it is important to mention an accompaniment of this acidity, that is the formation of "muck." One of the live questions of to-day is as to the extent to which the oxidation products and the muck are one and the same thing.

"Muck" Is the Cause of Much Trouble in Oil

In many turbine plants the mere creation of such acidity as that described above seems immediately to cause that most common of chemical actions, the attack of acid upon metal with the production of salts. These salts, which may exist in a turbine oiling system, have quite different properties with respect to different metals. For instance, when these acid products act upon zinc the resulting precipitate seems to be particularly voluminous.

To whatever extent, then, oxidation products essentially form muck the impurities in the oil are greatly increased when it comes into contact with metallic zinc, as for example in galvanized oil piping. Such piping should, therefore, not be used in turbine oil circulating systems.

In any case the muck itself is a detriment to lubrication. If the plant engineers are not watchful or are unsuspicious of the possible presence of muck, actual trouble may result. Some very large turbines in important power plants have had not only "near shutdowns" but have suffered the complete burning out of bearings from this cause. Such accidents, happily, rarely occur more than once.

What Shall Be Done with Run-Down Oil?

Now as to remedies, it is wise not to become discouraged too easily. The writer was informed some time ago that in a very large power station where bearing trouble had been experienced the engineers finally realized that unavoidable leakage and evaporation are not the only causes of oil consumption. They established an old-age limit for oil. When the oil reaches the age limit it is simply relieved from further duty, and the burden put upon new, fresh oil.

Such extreme procedure seems to the writer hardly to be justifiable. I believe that there are two lines of attack for the problem. In the first place, one of the most important facts connected with the whole subject of oil muck and its elimination from a turbine oil circulating system seems to be that certain features of such a system which tend most effectively to rid the

oil of water have a most perverse effect in hindering the elimination of muck from the system.

The subject of water in turbine oil has received much attention of late years. Among the features of importance are the property of the oil by which it forms an emulsion with water, and the relative ease or difficulty with which an emulsion once formed may be broken up and the water separated from the oil. The United States Bureau of Standards has come forward with notable contributions to the subject. In the equipment provided in power plants for cleaning and filtering oil it is very common to find apparatus for heating the oil about to be filtered, thereby rendering the separation of water much more rapid and complete.

Temperature Is an Essential Element in the Precipitation Problem

Unfortuately the deliberate heating of turbine oil in a filtering system interferes with the extremely important function of filtering, barring of course the separation of mere dirt and metallic particles. The acid oxidation products are in fact prevented from being separated by such heating. These products have a solubility in the oil which varies with the oil temperature. At high temperature the muck goes into solution, and as the oil cools the oxidation products are precipitated out as muck.

This variable solubility with changing temperature is the feature which perhaps more than any other makes the oxidation effect a very serious problem in turbine lubrication. While the oil is circulating in the bearings it becomes hot, and the high temperature favors the formation of the oxidation products with the accompanying increasing acidity. So long as the oil remains hot the oxidation products largely remain in solution.

Muck Interferes with the Operation of the Cooler

In the oil circulating system the oil which is bearing the lubrication burden at one moment is a moment later relieved and at rest in the oil cooler. As it is cooled, however, the acid oxidation products are precipitated. They settle out, fouling the cooling surfaces and reducing the heat transmission through the coils or tubes to the cooling water. Now if the oil-cooling process is interfered with, the oil returns to the bearings at a temperature already high, and it becomes hotter there than it otherwise would.

High temperature is without doubt an important factor in the formation of oxidation products, and consequently more muck is precipitated in the cooler. There is thus a vicious cycle of operations. It would be much worse but for the fact that as the oil heats its viscosity decreases and the bearing friction is thus reduced. Therefore the power loss in the bearings is reduced, since this loss in a bearing is proportional to the product of friction force and speed. With reduction of power loss in the bearings the oil is heated at a lower rate. The temperature reached is, however, much higher than it would be if the heat transmission surfaces in the cooler were clean.

The precipitation of oxidation products in the cooler and their separation from the oil after precipitation are by no means so complete as to render the oil leaving the cooler for the bearings practically free from them. These products contaminate the oil entering the bearings and beyond question increase its coefficient of friction. They are, however, taken up again into solution as the oil heats in the bearings, so that there is at least some compensation.

The Oil Reservoir Pockets Are Favorite Retreats for Muck

Nor does all of the precipitation of muck occur in the cooler. Much of it occurs in the pockets of the oil reservoir space, the temperature there being much lower than that of the bearings themselves. In these pockets the precipitate has the best chance of all to settle out, and when considerable time elapses between cleanings the extent and nature of the deposits are sometimes surprising. They are sometimes in the form of soft muck, often gummy and at times even approaching the consistency of pitch.

There is undoubtedly some danger that with such accumulations the distribution of oil to all parts of the bearings needing it may be interfered with. On the other hand, it is easy to exaggerate this danger. In the first place the high temperature of the oil in the bearings keeps the oxidation products very largely in solution where the oil is doing actual lubrication service. Then again the precipitation of these products, where such does occur, is small in relation to the quantity of oil in which it occurs, while the particles of solid matter come down in a state of very fine subdivision. Accumulations occur, therefore, generally only where circulation is very slow and where the oil is losing heat by radiation and conduction.

"Rejuvenating" Oil After Partial Disintegration

The very finely subdivided state of the precipitated matter must be kept in mind in devising means for dealing with the whole matter. As has already been mentioned, the oxidation products, due to their acid nature, may produce salts of metals which are themselves insoluble. These as solids have much to do in determining the quantity and form of the so-called muck. This is notably the case with the zinc salts which are apt to result from the use of galvanized piping. Without zinc, however, the precipitate is far from flocculent and its separation from the oil with reduction of acidity is a problem of importance in many a power plant to-day.

Unfortunately the filtering of power station oil is done largely with apparatus developed fundamentally to meet the requirements of engine oil filtration and modified in no really important and essential features to meet the turbine oil filtration problems of to-day. This lack of adaptation is indeed not strange if I am correct in arguing that only recently has the real nature of turbine oil filtration problems been correctly understood.

Turbine Oil Cannot Be Treated Like Engine Oil

There are two items in the problem which did not exist when the principles and practice of engine oil filtration were developed. The oil in engine circulating systems was contaminated by water and dirt. The water did not generally emulsify with the oil, or at any rate

the emulsions were not particularly tenacious. The separation of the water from the oil was rather easy. The heating coils frequently used in engine oil filters separated the water from the oil even in difficult cases. The separation of dirt from engine oil was, of course, a filtration problem of the simplest sort. So simple was it that many an engine oil filter was merely a crudely improvised collection of canvas bags, with not always the closest attention to eliminating leakage paths.

The separation of water from turbine oil was early recognized as of far greater difficulty. Persistent emulsions were not uncommon and the characteristic behavior of individual turbine oils in this respect began to be closely studied. Much was done in the quantitative measurement of demulsibility, and in this the United States Bureau of Standards took a leading part.

As previously mentioned the two essentials of turbine oil "rejuvenation" for continued lubrication service are (1) the solubility of the acid oxidation products in hot oil, and (2) the finely subdivided nature of these products when precipitated in cool oil. It follows that the filters must not be set to filtering hot oil. It may, however, be necessary to use heat to break up the water-oil emulsions, although even this necessity is questionable. It is quite essential that effective cooling shall be provided previous to filtration.

It may be well to mention in passing that the entire oil contents of a turbine, which is taken out of service for the purpose of cleaning and renewing its oil supply, should be run out of the reservoir as soon as the turbine has come to a standstill, thus insuring the minimum precipitation in the pockets or in the oil grooves and the maximum quantity of acid oxidation products carried out of the turbine in solution in the warm oil. If this is not done the oil will cool in the idle turbine and a certain amount of precipitation will occur.

The Filter Press Might Be Used with Turbine Oil

When provision had been made for cooling the oil in the proper place and thereby bringing the precipitation under intelligent control, there still remains the task of removing the fine precipitate, which cannot be done with bag filters. One hope in this direction is the filter press. For many years this device has been successfully used in many processes of manufacture and refining. Its use in power plants has been practically unknown until very recently. So far as the writer knows, F. R. McLean was the first to propose it for the clarification of turbine oil from precipitated acid oxidation products. For this purpose it is very attractive. It is not expensive, and is very compact. It has great filtering capacity and flexibility. The effectiveness of its filtering may be made anything that is desired. In the numerous manufacturing and refining processes in which it has long been used its place is quite unchallenged. Its future in steam turbine power plant service seems very bright.

The Whole Matter in a Nutshell

Summing up this whole matter, it may be said that the problems of turbine lubrication are problems of the durability of the lubricant. Water emulsions do no permanent harm to the oil but they are highly objectionable until broken up. The tendency of oils to emulsify and the measurement of their demulsibility have been studied extensively. The tendency of turbine oils to form oxidation products in service has been studied also, perhaps most actively by the oil men themselves. The progress so far made is uncertain and the field is unquestionably very difficult. Probably the oil men have learned more than they have told the rest of us. Some progress is also being made in tests which might be called "accelerated acid oxidation product test," but standardization of such tests seems so far a goal quite unapproached.

Short Pennsylvania Meeting

THE annual meeting of the Pennsylvania Street Railway Association was held in the Hotel Adelphia, Philadelphia, Pa., on June 7. About thirty members were present. In opening the meeting the president, Thomas A. Wright, vice-president and general manager Wilkes-Barre Railway, explained that in view of the war and the present abnormal conditions only a short session would be held for the transaction of business and the discussion of certain vital points.

After the report of the treasurer the nominating committee presented the following names for the ensuing year: President, Gordon Campbell, president York Railways; vice-president, T. B. Donnelly, claim agent West Penn Railways; secretary-treasurer, Henry M. Stine; executive committee, the president and the vice-president, and C. L. S. Tingley, second vice-president American Railways; C. B. Fairchild, executive assistant Philadelphia Rapid Transit Company; Thomas A. Wright, vice-president and general manager Wilkes-Barre Railway, and Thomas Cooper, Westinghouse Electric & Manufacturing Company. The nominees were unanimously elected.

After the election the meeting was addressed by Charles E. Morrison, representing the Utilities Mutual Insurance Company of New York. Mr. Morrison briefly traced the work of this company since the compensation act became operative in New York in 1914, and he said that the members are now receiving in dividends, with the approval of the State Insurance Department, 40 per cent of the premiums for the first year's business. In 1917 the company paid less than 10 per cent of the premiums for accidents, and in the last three and a half years the actual cash disbursements for accidents were 14.5 per cent of the premiums paid in. The average operating cost for this period was 18.5 per cent, making a total of 33 per cent. Mr. Morrison said that his company has under consideration the writing of business in Pennsylvania.

A motion was then carried to the effect that the president should appoint a committee to study the question of insurance and report to the association. The remainder of the meeting was devoted to a general discussion of the fuel situation and the need for and means of securing increased revenues. A committee composed of Messrs. Wright, Heindle and Fairchild was appointed to attend a meeting called by the Fuel Administration for June 12 in Philadelphia to discuss the use of coal by utilities. An informal dinner was served in the evening.

Current and Power Curves Show Results to Be Expected of Motors

By C. W. Squier
Electrical Engineer

The Writer Describes How Current and Power Input Graphs Are Derived From the Speed-time and Motor Characteristic Curves

HAVING determined the speed-time curve, as outlined in my article in the May 18 issue, the curves for current and power input are readily obtained. By referring to the characteristic curves of the motor given in connection with the previous article it is seen that with the same voltage the speed is always the same for any definite current value. With the series-parallel method of control, now universally used with direct-current railway motors, the motors are first connected in series and then in parallel when two-motor equipments are used. With four-motor equipments the most common practice is to connect the motors in groups with two motors permanently in parallel. These groups are connected first in series and then in parallel. With the two-motor equipment we are considering, from the start until the motors are connected in parallel the car current is equal to the current per motor, which is 90 amp., the current necessary to give an acceleration of 1½ m.p.h.p.s. With the motors connected in parallel, the car current will be double the current per motor, or 180 amp. This is shown graphically in Fig. 1.

To determine the point in the speed curve at which the transition from series to parallel takes place, we use the relation between speed and terminal voltage as discussed in the article referred to above. This change will be found to take place at a speed of 4½ m.p.h.

In order to plot the part of the current curve after the starting resistance is all cut out, it is only necessary to plot the current value corresponding to any speed at the instant that this speed is reached, as shown by the speed-time curve. In the case we are considering the current per motor is 90 amp. up to a speed of 9.9 m.p.h. At 10.35 m.p.h. the current with full field has fallen to 80 amp. and the change to tapped field is made. This increases the current per motor to 120 amp. From this point on the current values corresponding to the various speeds, as shown in the following table, are plotted. When a speed of 18½ m.p.h. is reached power is shut off and the current falls to zero.

SPEED, CURRENT AND POWER CONSUMPTION

M.p.h.	Seconds	Amperes per Motor	Amperes per Car	(Amperes)² per Motor	Watts per Car at 540 V.
4.5	3.0	90	90	8,100	48,600
9.9	6.6	90	180	8,100	97,200
10.35	6.93	80	160	6,400	86,400
10.35	6.93	120	240	14,400	129,600
11	7.29	106	212	11,236	114 480
12	8.00	88	176	7,744	95,040
13	8.97	74	148	5,476	79,920
14	10.29	64	128	4.096	69,120
15	12.01	57	114	3,249	61,560
16	14.23	52	104	2,704	56,160
17	17.09	47.5	95	2,256	51,300
18	20.70	44.5	89	1,980	48,060
19	25.41	42	84	1,764	45,360
20	31.78	39	78	1,521	42,120

The average current taken by the car is found by dividing the area of the car-current curve in ampere-seconds by the time for the run, including the duration of stop in seconds. In Fig. 1, the graph *OAGHKLMNF* shows the current taken by the car. Each cross-section square with reference to this curve is equal to $20 \times 2\frac{1}{2} = 50$ amp.-sec. When measured with a planimeter this curve was found to have an area of 55.9 squares, hence the average current per car for this run is $(55.9 \times 50) \div 71.2 = 39.25$ amp. The average current per motor, obtained from the graph *OABCDEF* in a similar manner, is 21.5 amp. The heating of railway motors in service is caused by internal copper, iron and brush losses. These losses vary in intensity and in distribution with different types of motors and classes of service. To determine whether a motor has sufficient capacity for a particular service, a curve should be plotted from the squares of the various current values and from this the square-root-of-the-mean-square current should be obtained. This should not exceed the rated continuous current of the motor for the average voltage found. For convenience the motor characteristic curves furnished by manufacturers usually give the continuous rating in amperes at half, three-fourths and full voltages. With modern self-ventilated motors this root-mean-square current practically determines the temperature of the motor, since the increased speed that goes with higher core losses also causes a better circulation of air through the motor and causes the dissipation of more heat.

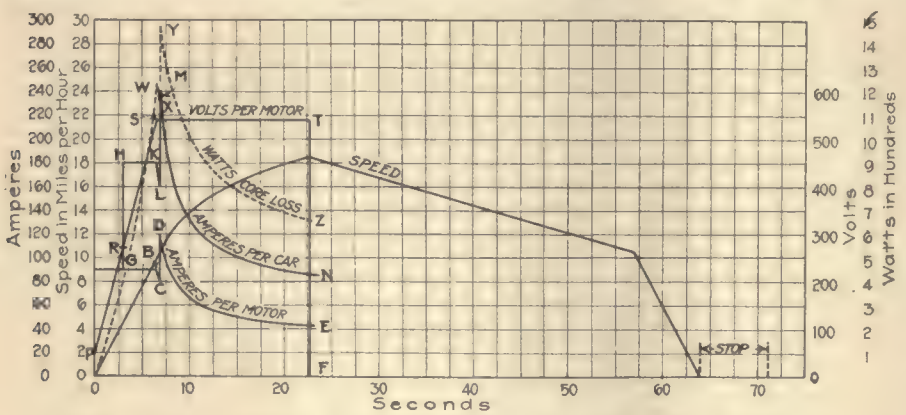


FIG. 1—GRAPHS FOR CURRENT AND CORE LOSS PER MOTOR AND AMPERES PER CAR

In Fig. 2 the graph *OPXYZMN* has been plotted from the squares of the instantaneous current values. The area under this graph, which can be conveniently measured with a planimeter, is 11.06 squares, equiva-

lent to 110,600 (ampere)²-seconds. The mean-square current is found by dividing this area in (ampere)²-seconds by the time for the complete run, including the duration of stop in seconds or 110,600 ÷ 71.2 = 1553. Then by taking the square root of this mean-square value we have 39.4 amp. for the square-root-of-the-mean-square current. The continuous current rating of this motor is 40.5 amp., so that we find this motor has sufficient capacity for the given service. The average voltage for each motor is found from the curve *OPRSTF* to be 470. The voltage curve is constructed by drawing a line through *R* (270 volts at 3 seconds and *S* (540 volts at 6.6 seconds) and then using the average line voltage of 540 for the remainder of the time that power is on. The area of this curve is 85.54 squares or 10,692.5 volt-seconds, which divided by 22.75 seconds, the time that power is on, gives 470 volts as the average that is applied to each motor during the run.



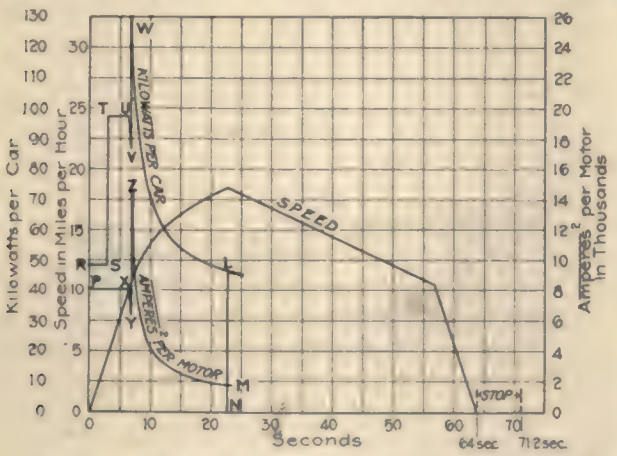
Accurate operating data are essential in choosing motors

Core Losses Are Determined by Tests

Fig. 3 shows graphs for the iron and core losses for this motor. These losses depend on both the current and the voltage. They follow no simple law as do the copper losses, which are proportional to the square of the current.

Owing to the great mass of metal in its frame, a railway motor has considerable heat storage capacity. When the temperature of the windings is rising that of the frame must also be increased, and when cooling the entire mass must cool off nearly simultaneously. The actual temperature of the different parts may, of course, be widely different but due to this action of storing heat, the temperature of the windings does not fluctuate rapidly in accordance with the instantaneous losses, but rises at a fairly uniform rate depending on the average value of these losses. The average core loss for any typical run may be obtained by plotting the curve *OWXYZF* as shown in Fig. 1, giving the core loss in the motor corresponding to the instantaneous values of voltage and current. To illustrate the method of plotting this curve, let us find the point on the core-loss curve at ten seconds after the start of the run. From the curves showing current and volts per motor it is found that at the ten-second point there are 66 amp. and 540 volts per motor. Then from the graphs shown in Fig. 3, we find the core loss corresponding to this current and voltage to be 1020 watts. This value plotted at the ten-second point in Fig. 1 will be the desired point in the core-loss curve. The average core loss for the run is then obtained by dividing the area under this curve in watt-seconds by the total time for the run, including stop, or 71.2 seconds. This gives 245 watts as the average core loss. The power-input curve is constructed from the car-current curve by multiplying the various current values by the average line voltage. In the table preceding, I have tabulated the various power values in watts corresponding to different current values, and in Fig. 2 the curve *ORSTUVWLN* shows this graphically. By measuring the area under this curve and by computing the values as described previously we find that 0.42 kw.-hr. is taken by the car for this run.

In considering various types of motors for operation in the same service with cars of the same weight, a comparison can be made directly from the results shown while performing the various typical runs representing average service requirements. When it is desired to compare equipments on the same cars, or on cars weighing nearly the same but operating at different schedule speeds, such a comparison as the preceding would probably be misleading and unfair to the equipments under consideration, since the above average values are dependent on the speed at which the car travels. A fair basis of comparison in such cases is found in the values expressed in killowatt-hours per car-mile. The present figure of 0.42 kw.hr. was for a



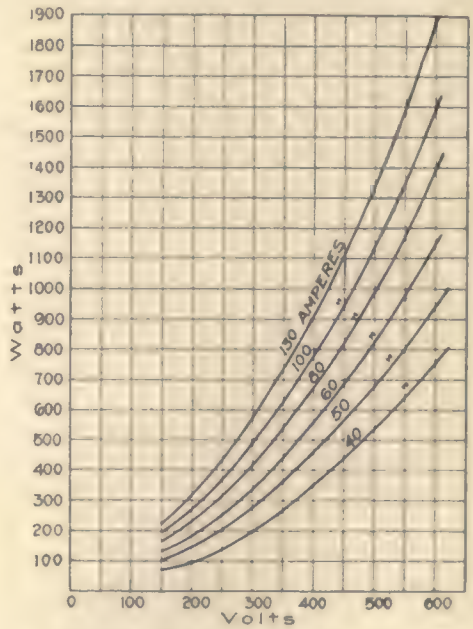


FIG. 2.—GRAPHS SHOWING HEATING CURRENT PER MOTOR AND KILOWATTS PER CAR. FIG. 3.—GRAPHS INDICATING THE CORE LOSSES IN MOTOR

run 1200 ft. long made in 71.2 seconds, hence the energy input is (0.42 × 5280) ÷ 1200 = 1.848 kw.-hr. per car-mile.

When it is desired to compare the performance of equipments on cars with considerable differences in weight, the units of watt-hours per ton mile should be used as a basis of comparison. This unit takes into consideration the difference in weight as well as any difference in schedule speed. The weight of the car with equipment and load which we are considering is 23.56 tons and (1.848 × 1000) ÷ 23.56 gives 78.4 watt-hours per ton-mile as the energy consumption.

In making comparisons all the associated conditions and the quantities affecting them should be carefully considered and taken into account and a unit for comparison chosen which will be fair to the equipment being considered and not be misleading as to the results that may be expected.

Changes in New Boston Cars

A NUMBER of changes in detail from previous designs are being made by the Boston Elevated Railway in the 200 new center-entrance motor cars which it is expecting to purchase. At first the company advertised for bids for cars exactly like those now in use in the East Boston tunnel, in which every feasible use was made of fireproof material. A study of these bids from manufacturers has shown, however, that on account of war conditions the work would be considerably expedited by a reduction in the metal used.

The stationary sash on both sides of the car, *i.e.*, the sash next to the center doors and upper stationary sash are to be of the same construction as in the trailer cars now standardized in the company's service, eliminating the fireproof or metal covering. The sash in use in the center-entrance motor cars is at present a wood sash with metal covering. It is the intention of the company to retain the metal covering on movable sashes only. In the new cars no headlining in the upper deck and hoods will be used, so that the construction will be roof sheathing on the ribs with no lining whatever, as in many of the semi-convertible cars now used by the company. The ingot iron covering is to be eliminated from the entire under side of the car, and in place of it, it is planned to install sheet-iron between the car floor and the motors, resistors and other electrical equipment for protection against flashes.

The center-entrance cars now in use in East Boston are now so equipped as to permit operation in trains of two or more cars. The type of car which it is proposed to purchase is intended to operate in trains of not more than two cars.

The new cars are to be built with the floors 1 in. higher above the top of the rail, to allow more space for the installation of motors and other equipment. It is the intention to have the distance from the top of the rail to the center compartment (first step) 15 in. in height as in the present cars. The additional rise will be on the step from the center of the car toward the ends. This step in the present cars is 9½ in. In a letter to the commission asking for authority to purchase the new cars President Brush pointed out that the foregoing modifications in the installation of fireproof metallic work will expedite the completion of the cars.

Reclaiming Car Axles by Welding

BY R. H. PARSONS
General Foreman Third Avenue Railway, New York

AS THE PRICE of car axles has increased about 250 per cent in the last three years and as deliveries are so uncertain, the purchase of new ones to replace those broken or worn in service is a hardship, and a good reason for devising some method of reclaiming them. Some companies have had good results with



FIG. 1—TWO AXLE ENDS IN POSITION FOR WELDING

blacksmith welding, but the use of the electric arc-welding process is a simpler operation. As a break in an axle occurs usually just outside the wheel, it leaves a piece long enough to work upon and sufficient material so that only the best of the remainder need be used.

The axle is burned off with the electric arc about 5 in. or 6 in. inside the wheel fit so that perfectly "live" metal only is utilized. When the two axles are burned to a V-shape as shown in Fig. 1, they are butted together by laying them in an angle iron resting on a horse. After this they are welded with the carbon electrode, using cold rolled steel as a filler.

The angle keeps the axles straight until welded sufficiently to hold their position, after which the angle



FIG. 2—AXLE WELDED AND READY TO BE TURNED TO SHAPE

is removed and the filling in is completed on the horse, as indicated in Fig. 2.

The shaft is then ready to be sent to the machine shop where it can be sawed or cut in a lathe to length and turned preparatory to mounting. The welded portion is nearly in the center of the axle and is scarcely touched with the tool, and good "live" metal is thus left for the wheel fit and journal. A good welder can prepare and weld two 4-in. axles per day, so the total cost of a finished, reclaimed axle is only about one-third that of a new one.

Keeping the Track Special Work in Repair

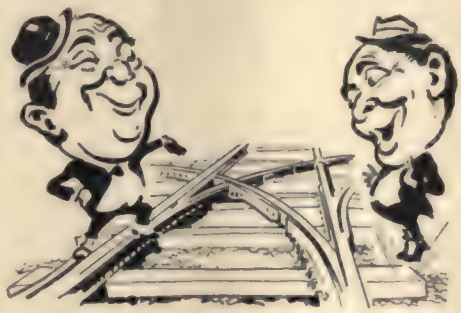
There Is a Field for the Special Work Repair Shop, but in General It Should Be Used Only for Minor Repairs or Emergency Jobs

By R. C. Cram

Assistant Engineer, Department of Way and Structure, Brooklyn Rapid Transit System

THE work of the way department begins to reach its fullest extent at this season of the year. The maintenance program is usually divided into at least three phases, *viz.:* (1) Reconstruction of tangent track; (2) overhaul and rehabilitation of tangent track, and (3) repair and renewal of special work. It is the purpose of this article to discuss the way department shop in its relation to this program.

Inquiry may first be directed toward the question of the need for such shops and it may be stated at the outset that no matter how small the railway may be, its way department has need at times for shop facilities, if only for tool sharpening in connection with the first two items of the program previously mentioned. With respect to the third item there is more chance for a wide divergence of opinion as to what shop facilities may be desirable.



"No, we didn't make this layout, but our little way shop will help us to keep it going another two years."

The majority of the electric railways are comparatively small in individual mileage, as indicated by statistics which show that most of them operate 50 miles or less of single track. Way departments of roads of this size have little need for shop facilities except for tool sharpening. In most cases this need is supplied by such equipment as may be found in their mechanical department shops, the work being done under shop orders originated by the way department. In some instances it is possible that this sort of work is done by outside shops under the purchasing agent's orders.

Small Shops Are All Right for Tool Sharpening, Etc.

The volume of shop work on tools incidental to track maintenance increases greatly when the mileage of single track approaches 100, especially if the road is situated largely in cities. A considerable amount of work is in constant demand, and it will generally be found advisable for the way department to have a shop equipped for tool sharpening for its own use. In making this statement, the advantages gained by having the work done in one general shop under other jurisdiction are not forgotten. These advantages are so often offset by delays due to the fact that the way department work is apt to be considered more as a "side line," if done by other departments, and the general shop will not readily lend itself to the execution of rush orders.

The simpler forms of shops are maintained as a rule for tool sharpening, although they can readily expand their activities to include the manufacture and repair of minor parts and fittings of roadway machinery and track construction. These shops do not require a large outlay for housing, site or equipment. The last named, in its simplest form, includes an anvil and forge, blacksmith tools, drill press, emery grinder, power hacksaw, Cleveland plate upsetting machine, and occasionally other simple machine tools for special purposes.

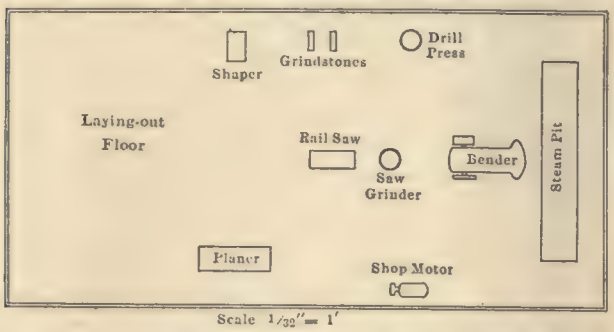
The repair and renewal of special work is a branch of track maintenance which is quite distinct as one of the most important functions of the way department. As the mileage of the system increases it is found that the number of special work layouts increases almost in direct proportion, and the layouts themselves are apt to become more complicated, particularly on city properties. Furthermore, the maintenance of electric railway special work, where confined to city streets, is thought to be somewhat more difficult than similar work on steam roads, not even excepting the renewal of such involved work as double slip switches with interlocking, such as are found in large terminal yards of steam roads. In contrast with steam road practice, the larger electric roads often undertake the manufacture of special work to quite an extent, while the steam roads do little or no work of this nature. The principal reason for this difference in practice probably lies in the characteristic differences in the general type of tracks. That of the steam road is usually of low T-rail and the switches and frogs are of a comparatively simple type, largely standardized as to lengths and angles and other details at least for each railroad system. This permits the purchase of repair parts as stock in advance of needs without unduly burdening the road with a large sum of money tied up in this material. The simplicity of the steam road type of construction also tends to a lessening of the stock needed and, as castings are not required for most of the work in general use, there is a consequent lessening in time required to fabricate parts. These factors not only reduce costs but also assist in securing material in a hurry from manufacturers, in emergencies.

Quick Repairs Must Sometimes Be Made

Tendencies toward failures can be seen more readily in open steam road tracks, and steps may be taken in time to have parts on hand before ultimate failure is reached. In electric railway work in streets, many of the frogs, switches, etc., are special, fitting only one location; they are usually made of deep girder rails and of a type requiring castings which may become defective and fail without giving any visible warning because the defects are apt to be hidden by pavement.

It is practically impossible for any street railway, having a large amount of complicated special work, to keep on hand even one replacement part for every different part to be found in its tracks. There would be too much money carried in idle stock. As a result the electric roads keep but small stocks of repair parts on hand. When sudden breakage occurs they must rely upon the manufacturers for rush service, which is sometimes difficult to secure and which even when obtained is often set at naught by shipping delays.

It is to offset such troubles that many of the larger systems have found it advisable to maintain shop facilities under control of the way department, which may be used to meet emergencies with a minimum of delay. In addition to emergency service these shops are utilized to fabricate various forms of temporary track layouts and special connections which are needed from time to time for rerouting cars during sewer construction or reconstruction of tracks. Such shops also make repairs to portable crossovers; they repair second-hand pieces to render them suitable for further service, and fabricate odd pieces which can be installed for the purpose



LAYOUT OF SMALL SPECIAL WORK REPAIR SHOP

of piecing out the life of some large layout until it becomes time to renew the entire job.

It is not to be assumed from the foregoing statement of work undertaken by way department shops that their operations can always be profitably extended to the work of manufacturing repair parts of special work. There must be a sufficient amount of work in hand at all times to keep the shop busy, if this feature is to be carried on economically.

When Is a Road Justified in Having a Special Work Shop?

The question arises as to what measure of the volume of work may be used as a guide in determining whether the work should be undertaken. In this respect it appears that the number of special work layouts in service is perhaps the best gage. Information as to the average number of layouts per mile of track operated is very meager. In 1911 the committee on way matters of the American Electric Railway Engineering Association gathered some data on this subject, but did not feel justified in publishing an analysis of the statistics because only about 20 per cent of the association membership furnished adequate replies on the data sheets. Nevertheless, taking the information furnished as a guide, it appears that those companies which reported special work shop facilities had an average of 1.3 layouts per mile of single track.

The average number of layouts maintained by those companies reporting shops operated for the repair of special work was 474. The lowest number was 110, while the highest was 1035. At the same time two companies, one having 1600 layouts and one 1400, reported no special work shops. It will thus be seen that there is a great range in practice of the companies in the matter of maintaining way department special work shops, and the data indicate that there is no general tendency to engage in the manufacture of special work in complete layouts.

$400,000 Spent Per Year on Special Work Repairs and Renewals

Minor repairs, as distinct from complete renewals of layouts, comprise the major portion of the work made up in such shops. As a gage in determining the advisability of maintaining them it may be of interest to note that one company which maintains approximately 1050 layouts spends about $400,000 per year on special work repairs and complete renewals, and about 15 per cent of this is for minor repair parts, most of which are fabricated in its own shop.

Aside from the report of the way committee for 1911 there is comparatively little published information available concerning this subject. Even the files of the ELECTRIC RAILWAY JOURNAL fail to show more than one article, which appeared in the issue of May 22, 1915. From these two sources and from data obtained elsewhere it is learned that the following tools, in addition to those previously enumerated as necessary for tool sharpening in a small shop, may be considered as constituting the principal equipment needed in those shops which undertake special work repairs: Rail bender, rail saw, rail saw grinder, switch and frog planer, punch and shear (combined), spring hammer and lathe. These machines are preferably operated by direct-connected electric motors.

In addition to the equipment enumerated, several companies which operate their own shops have found it advisable to install small foundry cupolas which, with proper accessories, are used for the small castings in special work. In two instances at least arrangements are made with outside foundries to make castings for special work which has been fabricated in the company shops. One company utilizes the cupola which it maintains for the cast welding of joints to good advantage in this field.

A Small Shop for $7,500

Practically all of the way department shops which engage in the repair of special work are the outgrowth from comparatively small shops first used only for tool sharpening and other light shop work. There are but few shops which were primarily designed to undertake such work and for this reason it is thought advisable to omit plans of existing shops from this article.

The JOURNAL article previously referred to presented a plan or layout of such a shop designed to carry on a reasonably large amount of work and this plan is reproduced in the accompanying figure. It was stated that a shop of the size indicated (50 ft. x 100 ft.) should not cost more than $7,500, completely equipped with the tools shown and with the necessary small tools, as well as an overhead or telferage system.

Attention was also directed to the possibilities of

lowering the first cost quoted by the purchase of second-hand machinery. The article further stated that such a shop could be operated with one foreman and fifteen men at a cost of $35.50 per day. (It should be remembered that these costs were for 1915.)

Experience Is a Factor in Special Work Repair Costs

Table I presents a set of labor and material costs for work turned out by the force of men referred to, and the following facts should be borne in mind in examining the tables:

"A comparison of the costs of various kinds of work turned out by men of this class over a period of three years is interesting. In this comparison fluctuations in the prices of material are not taken into consideration, it being assumed that the prices do not change. Where the cost is the same a like amount of material has been used, but where it is not the difference is due to using the material to better advantage or changing the construction slightly without sacrifice of strength."

Further, as to the work undertaken, it should be noted that none of these shops attempts to manufacture tongue switches as they have no facilities for so doing. They are, however, equipped to prepare curves, and to fabricate bolted frogs, girder rail mates, split switch points, plain switch tongues, hard center plates and special compromise plates made from bar steel.

TABLE I—SHOWING TENDENCY OF EXPERIENCE TO REDUCE COST IN SPECIAL WORK SHOP OPERATION

Bending 9-In. Rail, per Foot

	Guard	Tram
First year	$0 1281	$0 1106
Second year	.1051	.0962
Third year	.0732	.0654

Bending 7-In. Rail, per Foot

	Guard	Tram
First year	$0 1004	$0 0902
Second year	.092	.084
Third year	.0712	.0621

9-In. Frogs

	Labor	Material	Total
First year	$18.90	$39.07	$57.97
Second year	17 95	39 07	57 02
Third year	17.57	36.45	54.02

9-In. Mates

	Labor	Material	Total
First year	$22 64	$36 52	$59 16
Second year	20 32	36.52	56.84
Third year	16 03	32.98	49.01

9-In. Double-Track Crossings

	Labor	Material	Total
First year	$185 12	$294.35	$479 47
Second year	172 35	294.35	466 70
Third year	165.05	294.35	469.40

9-In. Crossover: Exclusive of Switch Castings

	Labor	Material	Total
First year	$79.96	$428.20	$508.16
Second year	78 25	428.20	506 45
Third year	74.75	431.30	506.05

Arc Welder Comes in Handy in Special Work Shop

Within the last two years or so the arc welder has been added to the shop equipment in several shops to good advantage. It is possible to make up frogs and mates with all parts welded together instead of being assembled with bolts, and the cost of the work is reduced by the welding method of assembly. Welded frogs and mates of this type have been in service sufficiently long to prove that they are as serviceable as those of the bolted type and in some cases they will outlast bolted frogs under similar service. The arc welder is also used to build up floors in welded and bolted frogs, so as to provide a flange bearing surface which in turn tends to prolong the life of the special work.

What One Large Shop Did in a Year

Tables II and III are presented to indicate the labor cost of operating a special work shop on a system which maintains about 1050 layouts. It is interesting to note that the total labor cost was at the rate of a trifle more than $10 per layout per year. This labor expenditure provided for the bending and drilling and cutting of 16,000 lineal feet of curved rail; it included the fabrication of forty-four plain bolted frogs, fourteen mates, six single frame 9-in. bolted crossings, one three-way frog and mate combined, nine sets of split switch points, twenty-nine crossover repair frogs, seventeen repair mates, two 7-in. crossovers complete except tongue switches, and 1364 pairs of compromise and plain joint plates made from bar steel stock.

The Best Shops Have Their Limitations

In considering special work shop undertakings by the railways, it must not be forgotten that these shops owe their existence largely to the need for emergency repairs and for tool work. They are not generally organized to undertake the complete construction of large complicated layouts having heavy castings. For this class of work they cannot hope to compete in cost with a well-organized commercial plant having thoroughly experienced workmen, able supervision and purchasing departments equipped for most careful buying. Careful computation of costs for such shops as are managed by the railways indicates that when all the overhead charges, such as those for light, heat, power, rental of buildings and site, clerical work, engineering and compensation insurance are added to the labor and material costs, together with the necessary investment in facilities for very heavy machine work and for steel, iron and manganese foundry work, the manufacturer still has the best of the argument as the most economical producer of new special work having heavy castings made up in large and intricate layouts. Furthermore, a railway shop organized for this sort of work would hardly prove economical unless it could find a need for complete renewal of several hundred layouts each year.

In conclusion it may be said that where the conditions do warrant the maintenance of a way department

TABLE II—LABOR COSTS FOR 1914 OF A SPECIAL WORK SHOP WHICH CARES FOR ABOUT 1050 LAYOUTS

Labor Costs of Special Work Shop—1914

January	$942 19	July	$956.26
February	908.34	August	921.37
March	915 69	September	945 28
April	988.86	October	965 10
May	1,040.32	November	937.18
June	995.20	December	890.05
Total			$11,385.84

TABLE III—ITEMIZED LIST OF EXPENDITURES FOR LABOR IN SHOP COVERED BY TABLE II.

Cut, bend and drill rail for renewals	$1,436.42
Cut, bend and drill rail for repairs	570.83
Make frogs	973.83
Make mates	518.26
Make crossings and repair parts	295.85
Make combination pieces	46.50
Make crossover repair parts	934.69
Make turnout repair parts	216.81
Make T-rail frogs, switches, etc	56.81
Make hard centers	247 59
Cutting and drilling Bessemer steel plates	1,793 60
Make split switch joints	74.48
Make and repair derailers	28.42
Repair steam switches and crossovers, O. M. S.	179.58
Repair portable crossovers	995 98
Make anti-straddlers and parts	105.95
Make and repair slip and expansion joints	202 00
Overhaul and repair O. M. S. special work	612.52
Make guard rail	15 10
Cut, drill and straighten rail	220.03
Make tools	628.34
Make and shape bender blocks	98.78
Overhaul machinery	168 35
Moving and handling material on dock and in shop	695.00
Cleaning up, watchman and miscellaneous work	270.12
Total	$11,385.84

repair shop, the following advantages may be attained. They are enumerated after consideration of advice received from several engineers of roads which have such shops at their command:

1. Built-up work of a really high-grade character can be produced at a cost of about 50 per cent of the ordinary prices of such work when obtained from manufacturers.

2. The manufacture of parts can be undertaken and executed in a very short time, thus providing against emergencies of almost every description.

3. The short time required to turn out work makes it possible to withhold replacement expense until immediate action is necessary.

4. It becomes unnecessary to carry large and expensive stocks of the various repair parts.

5. The remodeling and repair of old special work may be undertaken and valuable material can thus be saved for further service, preventing undue haste toward the scrap heap.

6. The reconstruction work may be executed in accord with a prearranged schedule and without the hold-up so often experienced while waiting for arrival of much-needed special work from a manufacturer.

7. The embargoes and shipping delays now experienced are rendered almost void of their vexing features.

An Unusually Difficult Special Work Job*

A Complicated Layout Installed at a Busy Intersection in Washington, D. C., Involving Only Slight Interference With Traffic

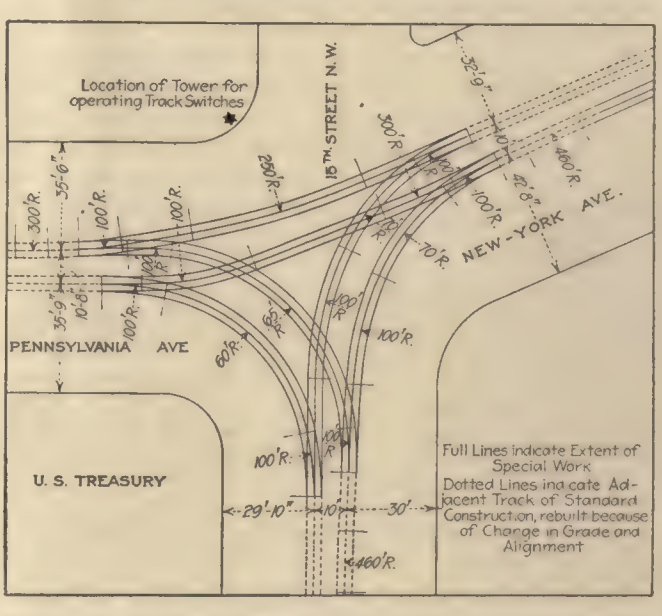
BY H. P. HUNTTING
Engineer of Way Capital Traction Company

THE Capital Traction Company has recently completed the installation of a double-track three-part Y special-work layout on its lines at Fifteenth Street and New York Avenue, N. W., under the most difficult conditions that its engineers have ever encountered in a job of this type. The intersection is at the most congested traffic point in Washington and is the "throat" of the company's system. On account of its prominent location and the seriousness of interruption to the enormous public traffic at this point every effort was exerted to complete the installation as quickly and smoothly as possible.

The work, a plan of which is shown herewith, consisted of installing two new double-track connected branch-offs, to permit the operation of cars direct from Pennsylvania Avenue to New York Avenue; the complete renewal of the double-track branch-off from Fifteenth Street to Pennsylvania Avenue and New York Avenue, and the reconstruction of short lengths of tangent track at the exterior ends of the branch-offs, the latter work being necessary to take care of the change in grade and alignment. The total length of track installed was a little more than one-fifth of a mile. This layout is one of the three most complicated in Washington; the other two being at Delaware Avenue and C Street, N. E., and Ninth and G Streets, N. W.

The entire track layout was of the underground conduit type of construction, in use throughout Washington, which requires much more work and presents more problems than the surface construction used in most cities. Coincident with this work, a system for operating the track switches from a tower on the northwest corner of Fifteenth Street and New York Avenue was installed.

Preceding the actual installation of the layout there were two preliminary surveys. One was made by the special work manufacturers and the other by the company's engineer. From the data obtained in these surveys, a general plan was prepared and submitted to the District Commissioners for approval. The layout was designed to give clearance throughout between cars passing on parallel tracks. In order to obtain this it was necessary to use a long-radius reverse curve on one track at each end before reaching the branch-off. This rather detracts from the general appearance of the layout in the street, but does not affect its easy riding



PLAN OF TRACK LAYOUT INSTALLED AT FIFTEENTH STREET AND NEW YORK AVENUE, WASHINGTON, D. C.

quality appreciably. These reverse curves were used because the centers between tangent tracks on Fifteenth Street and New York Avenue are only 10 ft., whereas the company's standard track center distance is 10 ft. 8 in. Although obstructions at this location were rather numerous, they were fortunately all deep enough to be out of the way with the exception of the old cable-road vault now used as a feeder cable manhole by the company. It was found necessary to lower part of the roof of this vault to permit construction of the new track between Pennsylvania and New York Avenues.

As it was practically impossible to do any staking out on this job except on Sundays on account of the heavy street traffic, this part of the work was started about a month ahead of the completion of the special work layout. In addition to staking out the survey points on the line of track and the location of yokes it was necessary to offset all points, so that after excavation was started it would be possible to obtain the accurate location of the new track. The setting of approximately 550 points, including offsets, was required.

In the meantime, upon completion of the fabrication

*Abstract of paper presented before American Electric Railway Association Company Section No. 8.

of the layout it was set up on the yokes in the yard of the manufacturer, the Lorain Steel Company, exactly as it was to be placed in the street and the correctness of line and dimensions checked by its inspectors, while the company's representative checked the general alignment and gage of surface work, and the workmanship and finish of all castings.

The real difficulties began with the actual work of installation. An attempt was made to do excavation work at night when there was little or no traffic, but the force showed a strong dislike to night work and would not come out regularly. Progress was somewhat facilitated by beginning work at daybreak and working as large a force as could be secured on Sundays. It was at first thought that bridges could be installed for vehicular traffic but this did not prove to be practicable. During the office trips the congestion at this point was considerably increased and it was necessary practically to suspend work during those periods. The work was also retarded to a large extent by inability to secure adequate and competent labor.

The installation work was started on Sept. 10, the excavation and the setting up of the surface work prior to placing it in the street being the first job. The special work had to be assembled near by in order to



SPECIAL WORK LAYOUT AFTER COMPLETION OF WORK REQUIRING CHANGE AT NIGHT

fabricate the conductor rail and to obtain measurements for cutting the existing track to fit the new work. The use of a vacant lot was obtained and the layout was set up there.

The actual installation had to be made when the cars were not in operation and on account of the difference in alignment between the new layout and the old it was necessary to have the first night's work include the installation of the Fifteenth Street branch-offs and the tangent track at the south end and to swing part of the old curves over to meet the new work. Considering the inefficiency of the force, it was a big task to be done in one night.

Cars were rather badly tied up next morning, all lines being delayed until 5.30 o'clock, when the eastbound cars from Georgetown were put through half an hour late. The line was not cleared in all directions until 8.50 when the Fourteenth Street southbound cars were put through, three and one-half hours late. An additional handicap on the work was imposed by inability to bring the surface work from the lot to the job until night, after traffic had died down, and this preliminary work tended to sap the energy of the workmen and created some confusion. On this property all special work has to be moved by hand after it has been hauled to the job, as the small amount of this work which the company has does not warrant the purchase of any expensive hoisting machinery.

The installation of the Pennsylvania Avenue branch-offs, made the following week, involved a full night's work but was finished without any appreciable delay to car service. The New York Avenue branch-offs were installed during two separate nights because of the inability to get the necessary excavation completed in time to make the entire installation on the following Friday night, on which night it is found most advantageous to make track changes. The photograph reproduced on this page shows the condition of the work after the installation of the tracks which it was necessary to change at night.

After the installation of the new steel work it was surfaced and lined, its grade was checked by the District engineers and the lower parts of the yokes were concreted to hold the work in place while the forms for the tube concrete and the tube concrete itself were being installed. The work on forms for the tube concrete was the slowest part of the job as special forms had to be made for all the branch-offs and curve crossings and only workmen possessing experience and skill could be used on this sort of work. Considerable additional excavation was required to make room for the forms, ducts for jumper cables around cutouts and switch-operating cables had to be installed, sumps for track drains had to be dug, manholes for switch-operating mechanisms had to be constructed, the roof of the cable vault had to be lowered, etc. The paving was installed by the District and completed with the exception of the adjacent roadway on Dec. 7, finishing the job practically in three months after starting.

The installation of this work was very expensive, as the following summary of costs will indicate:

Installation of double-track three-part Y (784.28 ft. of single track):	
Labor	$10,537.46
Material	38,511.59
Hauling	916.89
Paving, labor and material	1,516.31
Underground obstructions	170.16
Total	$51,652.40
Renewal of tangent track exterior to special work (303½ ft. of single track):	
Total—labor, material and paving	4,272.62
Installation of switch operating layout:	
Total, excluding cost of switch tower	2,217.83
Gross total	$58,142.85
Credit from steel removed	1,903.66
Net Total	$56,239.19

Transformer Repaired in Record Time

A 1100-kva. transformer in the Quincy Street substation of the United Railways of St. Louis short-circuited during the night time recently and the station was put out of commission. The transformer was dismantled, the coils removed, repaired and again installed in the transformer and the laminations relaid by hand. This work was entirely finished and the transformer returned to service in five days. When it is considered that this transformer weighed 15 tons and there were 50,000 laminations to be taken apart and relaid, the size of the task can be appreciated.

How the Underframe Contributes to the Durability of the Car Body

By Norman Litchfield

Steel Sills, Bolsters, Cross-bearers and Anti-telescoping Buffers All Play Essential Parts in Making the Modern Car Shock and Vibration Proof

WITH the advent of the double-truck car in railroading it became necessary in body design to provide some means of transmitting the loads carried by the series of longitudinal sills forming the floor framing of the ordinary wooden car body to one central point over the center of the truck so that the latter could be able to pivot on its axis when rounding curves. The most convenient and simplest method of accomplishing this was by the use of a cantilever structure composed of two flat iron plates stretched transversely under the sills and separated at the center by castings, the general design being as shown in Fig. 1. As soon as the electric motor began to be applied to passenger car trucks for suburban and rapid transit service the necessity of providing sufficient space for the motor, coupled with the desire to keep the car body as low as possible for ease of access and on account of existing overhead clearances, made it necessary to build the bolster around the sills instead of entirely beneath them (see Fig. 2).



"No Danger of Straining the Body with an Underframe Like That!"

These designs held sway for several years and, in fact, are in general use to-day although they have several disadvantages which will be discussed later in more detail. These disadvantages have led to their being generally superseded by more efficiently designed structures which have become possible through the development of the steel car.

The newer design may be termed the cover-plate-and-diaphragm structure which now is in general use for all kinds of cross-bearers, whether they be the body bolsters or the intermediate transverse members originally known as "needle beams."

The design rests upon the principle that a girder consists in its elements of top and bottom members, properly proportioned to withstand the tensile and compressive stresses, and a connecting web to resist the shear. The web does not need to be continuous and consequently can be built in sections between the sills, while the cover plates pass over and under the sills. In some cases where the stresses are clearly defined the compression-chord cover plate may be omitted, reliance being placed upon the fit of the diaphragms against the sills to transmit the compressive strains. A typical design is shown in Fig. 3.

For the proper design of the bolster structure it is necessary as in all the other structures to make some analysis of the strains set up by the loading. Under ordinary conditions, with the car standing level and having the proper clearance at the side bearings, the body bolster is essentially a true cantilever with an equal load applied at each end through the side sills. This is transmitted through the body bolster structure to the center plate. The moment diagram for this condition is shown in Fig. 4, the loads used being those found in the analysis of the side structure given in the earlier article.

Applying this moment diagram to the style of bolster shown in Fig. 2, it will be seen that while the structure is sufficiently strong at the center it is weak at the ends. This weakness is due to its construction at three points where the plates have been placed flat together to permit the application of the bolts or rivets which tie the plates together and take the longitudinal shear. Where it has been desirable for local reasons, such as maintenance of exact location of side bearings so as to permit interchange of trucks, to perpetuate this general character of bolster design some improvement has been made by the insertion of a filler piece between the upper and lower plates as shown in Fig. 5. As there are many bolsters still in service in which it is not feasible to insert a filler piece as indicated, attention may be called to the fact that resource may be had to a pressing or gusset placed on top of and riveted to the top plate and flanged out sideways against the side sill and bolted or riveted thereto (see Fig. 6).

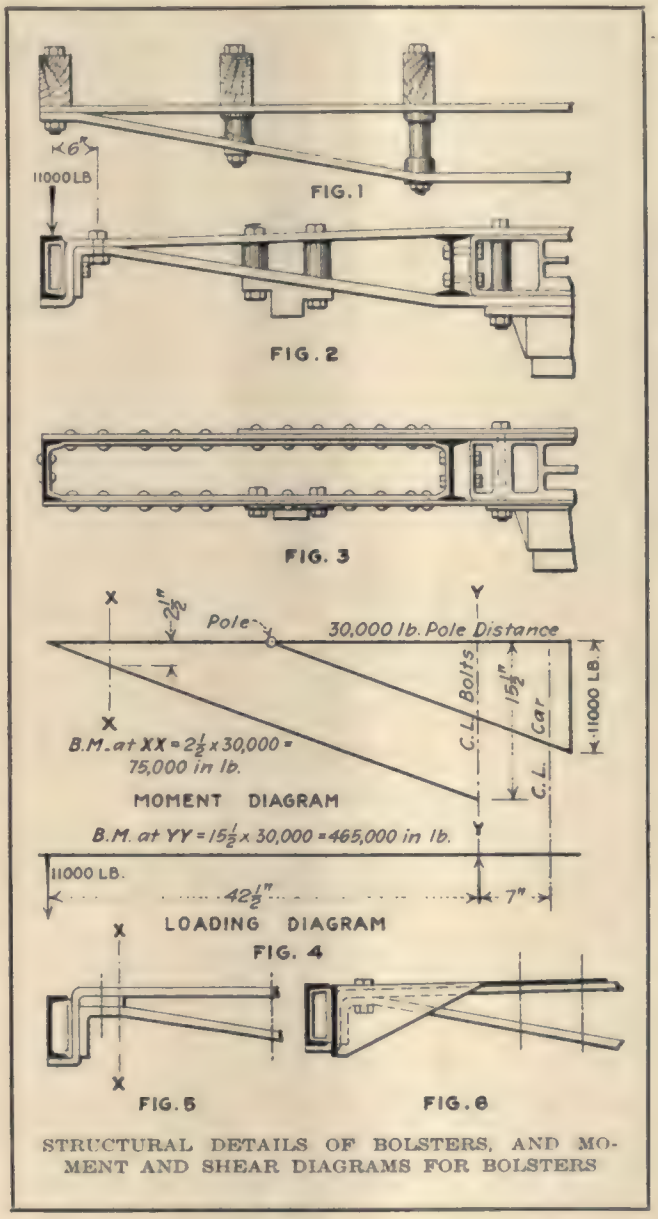
The second condition which must be considered is that which occurs when the car body has tipped so that it rests equally on the center plate and one of the side bearings.

Whenever a car is rounding a curve at high speed the effect of centrifugal force is to take weight off the center plate and to transfer it to one side bearing. The car is at the point of tipping over when all of the weight has been transferred to the outside rail, and proper consideration must be given in the design to cover the condition.

The final case to be considered is one which is more applicable to service cars than to passenger cars, namely that occurring when the car is jacked up under the side sills with the load in the car.

All of the foregoing discussion takes into consideration only the vertical loads coming from the body structure, the passengers and the equipment. In addition to these there is the fore-and-aft thrust caused by the acceleration of the car by the motors and the re-

tardation by the brakes. The effects of both of these are intensified by the fact that the accelerating and retarding forces are applied at the point of contact between the body and the truck center plates. This point is located at a considerable distance below the neutral axis of the bolster structure, thereby causing a twisting action the intensity of which may be estimated by assuming that the car is being retarded up to the slipping point of the wheels on the rails. This retarding force multiplied by the distance between the contact point of the center plates and the neutral axis of the bolster gives the turning or twisting moment which the bolster has to resist. The usual flat plate construction, such as outlined in Fig. 1 is, in general, sufficiently strong in itself not to show any bad effects from this twist. But plate construction, such as narrow that considerable difficulty is experienced in the connections of the bolster to the sills which show wear and a tendency to loosen, and in wooden cars there is a tendency to break the sills. The matter is still further complicated on cars designed for train operation, and in which the drawbar swivels about the king pin, for in this case to the strains already enumerated is added that coming from the pulling and pushing action between different cars. This condition is, of course, most severe when a train of cars is hauled by a locomotive, but is by no means absent in trains consisting of motor cars. Here it is due to different accelerating rates of the motors with varying sizes of wheels, different designs of motors, irregular action of brakes, etc., so that in any event this effect of the buffing strains must be given attention if the design of the bolster is to prove satisfactory.



STRUCTURAL DETAILS OF BOLSTERS, AND MOMENT AND SHEAR DIAGRAMS FOR BOLSTERS

Where the bolster is built around the sills the effect is less pronounced than where the bolster is entirely beneath them, and the cast fillers usually employed can conveniently be extended fore-and-aft along the center sills and fastened securely to them so as to present a broad base to resist the turning moments resulting both from the braking and buffing strains.

It is in the resisting of these secondary twisting and shearing loads that, as a general thing, the old plate type bolster is least efficient due to its loose-jointed construction. On the other hand it is a simple matter to build bolsters of the more modern diaphragm type with sufficient width of cover plates and with diaphragms properly fitted and riveted to the cover plates and sills to overcome any tendency of trouble from this source.

Another feature which cannot be overlooked is that of the deflection of the bolster under load. With the small side-bearing clearances ordinarily used in electric passenger car service it takes but little deflection of the bolster to bring the latter down solid on the side bearing, thus causing difficulty in the swiveling of the truck on curves. Here again the flat-plate bolster has not the desirable qualities of stiffness that the bolster of the diaphragm design possesses. For all of the foregoing reasons, therefore, the latter has come into general favor, and the old style remains only in cases where certain local conditions are controlling. In the design illustrated it will be noted that the webs of the bolster are shown rigidly attached to the side sills. There has been some criticism of this feature by designers who have felt that the twisting action of the body over uneven track is such as to make it desirable to approximate the trunnion joint of a bridge support. They have therefore built the ends of the bolster in the form of a sort of chair on which the side frame rests loosely. This arrangement however is not at present as largely used as the rigid connection. The transverse members of the floor framing have gone through a process of evolution similar to the bolsters. As before pointed out it is customary in cars which depend chiefly on the side structure to carry the load to use center sills of a section which in itself is not strong enough to carry their own portion of the load from bolster to bolster without undue deflection. They therefore have to be propped up by cross-pieces so that the excess load is transmitted to the side frames. This was accomplished at first by the use of wooden beams underneath the wooden center and other sills. These beams also formed the base for the longitudinal truss-rod queen posts, and were generally known as "needle beams." Where a simple beam was not strong enough it was reinforced by transverse truss rods.

The adoption of steel members for underframes permitted a simplification in the design of these cross-bearers just as it did in side frames as bolsters. Some cars were built with cross-bearers of rolled structural shapes running continuous from side sill to side sill. As this necessitated cutting the center sills, if all members were to be kept at the same level, which is desirable for several reasons, this construction soon gave place to the cover plate and diaphragm type similar to the bolster construction already described. The latter is now very generally used throughout steel-car construction, both passenger and freight.

A type of cross-bearer intermediate between the old needle beam and the diaphragm type was an ingenious truss construction utilizing a diagonal brace from the belt rail to the center sill. Thus this member, with the corresponding window post and floor support, virtually formed a cantilever arm from the side girder. As this diagonal member extended well out into the center of the car the construction was available only where cross-seats were used with a narrow aisle between. When the possibilities of the diaphragm construction became evident the truss construction was superseded.

Attention has already been called to the heavy strains that are imposed on the floor framing members by buffing shocks, either by the drawbar through its spring gear or directly by the end sill in collisions. To tie the center and end sills together securely, and so to distribute the end loads more or less equally among all sills, it is quite general to use a flat plate some 20 in. wide riveted to the bottom flanges of the end and longitudinal sills. This plate is known as the anti-telescoping plate, its worth having been shown in many instances in actual service.

For ordinary light or semi-heavy service, where the use of a spring buffing device is not considered necessary or desirable, two opinions have held as to the proper design of end construction of floor frames. One rests on the theory that the bumper should act as a cushion and, therefore, a wooden timber is utilized for this purpose. The other is based on the desirability of as far as possible maintaining the alignment of the sub-frames of the colliding cars by the use of anti-climbing devices on the front faces of the buffers, which are constructed of steel and rigidly connected to the sills. In this case allowance is made for the final absorption of end shock by the crippling locally of the buffer member between the center sills, and in cases of severe shock the crippling of the center sills at a point close to the end construction where this action will do the least damage.

One more feature remains to be considered in the design of floor frame, namely, that of lateral stiffening. As a rule, wooden floor frames were bound together with cross-tie rods running beside the transverse timbers fitted between the sills. They were braced diagonally by tie rods and generally provided with turnbuckles. Steel construction permits the elimination of these various truss rods, the riveting of the cross-pieces to the sills together with suitable gussets tying the main members securely together. The anti-telescoping plates already referred to provide additional side bracing which is still further augmented by steel floor plates at platforms and monolithic floor construction laid on corrugated or special section steel.

The simplification which the use of steel permits in construction is shown by the many points already enumerated, and simple study of the relative strength of given sections will indicate the reduction in weight which its use permits as against all-wood construction.

A Local Symptom of a General Disease

In Describing St. Louis Situation, Engineer Says Electric Railway Industry Throughout the Country Is in a Bad Condition

C. E. SMITH, consulting engineer, in a recent address before the Engineers' Club of St. Louis, Mo., said that during the last six months of 1917 he had received the impression that St. Louis was considerably agitated over its electric railway situation, but that not until his recent trip to Washington did he realize how general is the agitation of this sort. In fact, he said the condition in St. Louis is merely a local symptom of a general disease. On the one hand, electric railway investments are in a bad way, and, on the other, the public is in a bad way for proper service. In his opinion, the situation must be handled in a big way or the trouble will not be overcome and the communities interested will be severely injured. Continuing, Mr. Smith said:

"Unfortunately the public has not yet fully realized the relation between rates and the cost of service, and in the consideration of new franchises it has demanded the right to specify the quality and the quantity of service without making proper provision to meet the expense. Under the theory of service at cost the companies and the public should both realize that their interests are mutual.

"If service of the quality and the quantity demanded by the public costs more than 5 cents, the public should cheerfully pay the proper price. If it costs less than 5 cents, the public should have the benefit of reduced fares. If an arbitrary limit of 5 cents is imposed, however, the public should be satisfied with such a quality and a quantity of service as 5 cents will pay for. If the service is neither sufficient nor satisfactory, the public has the alternative of suffering the unsatisfactory service for the benefit of the lower rate, or of paying the higher rate for satisfactory service."

In the course of his remarks, Mr. Smith presented a résumé of the company's problems and of the negotiations that led up to the present ordinance now awaiting the company's acceptance. He included a summary of the new ordinance and also of the franchises in Chicago, Cleveland and Kansas City.

College Test Car Busy on the Shore Line

The test car belonging to the electric railway department of the Worcester Polytechnic Institute is making a detailed test of track conditions on the Shore Line Electric Railway of Connecticut. The 200 miles of track belonging to this system will be covered thoroughly, and sources of power waste, mechanical defects in track and line, etc., will be investigated. The car is in charge of faculty members of the electrical engineering department of the institute.

Selecting Lightning Arrester Types to Suit Requirements

By Q. A. Brackett

Engineering Department,
Westinghouse Electric & Manufacturing Company

The Author Discusses the Applicability of the Electrolytic, Multipath and Condenser Types to Several Classes of Service and Gives Some Suggestions for Their Installation and Maintenance

IN ELECTRIC RAILWAY work the lightning arrester is often a rather neglected part of the equipment, yet it is one which may prevent expensive repairs. There are various types of railway arresters and these offer varying amounts of protection. There are likewise very different operating conditions in different parts of the country which bear directly on the type of arrester that should be used and the amount of attention that it should receive.

In most large cities where there are many steel buildings and overhead wires, lightning conditions are not very severe, but the number of cars to be protected is very large. In such cases a comparatively cheap type of arrester could be used. On interurban lines, especially those located in mountainous regions or districts in the natural path of storms, a higher grade of arrester with greater protective power will be required, and it will be more important to give the arresters frequent and careful inspection to insure their being in condition to give the best results.

The experience of this company has shown that the electrolytic, multipath and condenser types all have their places in electric railway service. In power houses and substations arresters should be provided for the protection of the generators and rotaries. As the number required is small and the value of the apparatus to be protected is high, only the very best grade of arresters should be used. This means that in general all such equipment should be protected by electrolytic arresters of the same large capacity that are used for the protection of large alternating-current systems. The condenser arrester can also be used with excellent results for the protection of station apparatus, especially where two are used in parallel. The Westinghouse "MP" or multipath type of railway arrester consists of a molded carborundum block in series with a small spark gap, all inclosed in a weatherproof galvanized iron box. The carborundum block has very high resistance up to a certain critical voltage above which it breaks down into a multitude of series and parallel spark gaps having little or no resistance. After the high voltage passes, the discharge is quenched by the subdivision of the current into many minute series and parallel arcs, which individually have insufficient voltage to maintain themselves. The cooling effect of the great mass of the block, in intimate contact with the arcs, also aids greatly in stopping the flow of current. When the discharge has been stopped the block regains its high resistance. The great advantage of this arrester is its rugged simplicity and its corresponding low cost. It is at present limited to 750 volts direct current, but it is particularly suitable to urban railway systems where the number of cars is very large and the lightning troubles small. On account of its rugged nature, with no moving or delicate parts, it requires no maintenance or inspection, except to see that the circuit is complete to and from the arrester. This low maintenance expense also makes it particularly suited to large installations.

For interurban lines and installations that are exposed to severe lightning conditions, it is desirable to use an arrester of greater protective power than the multipath type. Very effective protection can be obtained from the condenser type. This arrester can be mounted in any position on a car or pole and has no liquid to spill or moving parts to get out of order. It is unaffected by heat or cold and requires no attention

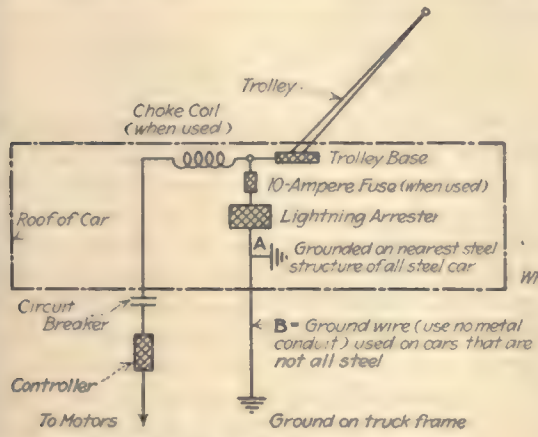


FIG. 1—DIAGRAM OF CONNECTIONS FOR MOUNTING ARRESTER ON CAR ROOF

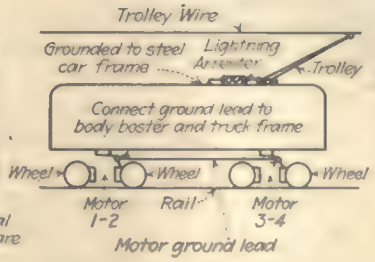


FIG. 2—METHOD OF MOUNTING AND GROUNDING ARRESTER ON ALL-STEEL CAR BODY

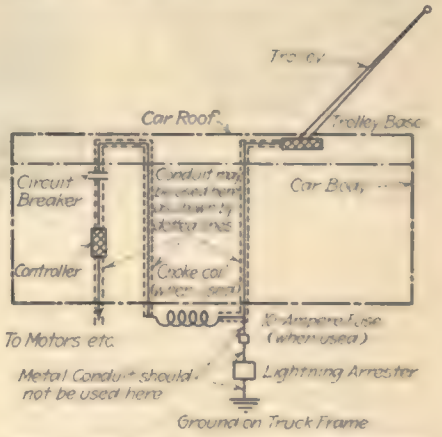


FIG. 3—DIAGRAM OF CONNECTIONS FOR MOUNTING ARRESTER UNDERNEATH CAR

or maintenance except to keep the leads to and from the arrester intact. It consists essentially of a high insulation condenser in a molded composition case, inclosed in an iron box of rugged design. The condenser unit is easily renewed although this is rarely necessary. This arrester was originally designed for the higher voltage direct-current lines and it has been very successful where much trouble had been experienced with other types of arresters because of the viciousness of the power arcs that had to be broken. It is equally effective, however, at lower voltages. It is connected between line and ground, either with or without a series spark gap. When no gap is used, the arrester has the advantage of starting to give protection instantly, without the rise of voltage or time lag usually required to break down a spark gap. This makes it particularly valuable for the protection of old or weak insulation. The protective effect depends on the fact that the impedance of a condenser is lower, the higher the frequency. The frequency of lightning is so high that the condenser used offers practically a short-



FIG. 4—MULTIPATH TYPE CAR ARRESTER



FIG. 5—CONDENSER TYPE ARRESTER

circuit to ground for the surge, yet all the time it allows none of the direct current to escape, and so has no power arc to break following the discharge. It is a valve that automatically selects the lightning only, and passes it freely to ground without permitting the escape of any dynamic power whatever.

Where dependence is placed on low-priced arresters it is very necessary that they should be properly installed. During past years arresters have usually been mounted underneath the car, but recently there has been a growing tendency to locate them on the roof. On all-steel cars with the arrester in this location the ground connection can be made directly to the roof, but unless an absolutely continuous circuit through the body of the car to the trucks is assured it will always be desirable to run a separate copper lead from the ground side of the arrester to the trucks. Even in the case of wooden cars the location of this device close to the trolley base on the roof is preferable from a protection standpoint if it is of a type which can be so mounted. When the arresters are mounted underneath the car the leads to and from them should be as straight as possible and should not be inclosed in metal conduit. Wooden conduit may be used when desired. Excellent recommendations regarding arrester installation on cars are given in the report of the arrester committee of the American Electric Railway Engineering Association.

When a choke coil is used care should always be taken to see that the arrester is connected to the line between the trolley and the choke coil so advantage may be taken of the piling up of voltage that will occur at the trolley end of the choke coil when a surge occurs.

The leads to and from the arrester should be not less than No. 6 B. & S. gage. This is not so much from the standpoint of conductivity as because a small lead may become broken due to continual vibration or corrosion and thus leave the car without protection until the break is discovered. On the other hand, there is always the possibility of a surge that is too heavy for the small arresters used in this class of service and that the arrester will, therefore, burn up. In such a case the heavy leads recommended above will prevent the arrester from burning itself free and the line will remain short-circuited. For this reason a fairly heavy fuse in series with the arrester is sometimes recommended. There is, however, danger of the fuse being open and the arrester disconnected without its being noticed, unless very frequent inspection is carried out. For that reason the majority of operating companies seem to prefer to use no fuse, but instead to compel the car crew, in case of trouble, to pull down the trolley and cut the leads free from the arrester.

In any case frequent inspection of the arresters and their connections should be made. In general, inspection after each storm and at the times of regular car inspection should be ample.

POLE ARRESTERS GIVE ADDITIONAL PROTECTION TO EQUIPMENT AGAINST LIGHTNING

In addition to the car arresters, lightning protection is obtained from arresters distributed along the line. These arresters are mounted on poles spaced approximately five per mile and should also be installed at points where the feeders tap onto the trolley wire. These arresters must be suitable for outdoor mounting on poles where they can withstand all conditions of weather with comparatively infrequent inspection. The same danger of an arrester failing and grounding the line exists in the case of pole-line arresters, but there is not the same possibility of quickly disconnecting it that there is in the case of the car arresters. It is, therefore, very desirable that all pole-line arresters be so arranged that they can burn themselves free in case of failure, as otherwise it may be necessary to send a repair crew over the whole line to search for the ground. A standard outdoor fuse can be used in the circuit, but it is cheaper and generally sufficiently satisfactory to use a short length of small-diameter copper wire somewhere in the line or ground lead which, in case of failure of the arrester, will burn in two and hang down in some conspicuous manner so that the motorman of a passing car will notice it and report it on his return.

The ground connection for pole-line arresters should be made by driving an iron pipe 5 or 6 ft. into the ground and connecting the ground lead to it. Except for the short length of small wire mentioned above for use as a fuse, the ground lead should be of substantial size so as to make sure that it will not corrode or break in two. The ground around the iron pipe when installed and yearly thereafter should be thoroughly saturated with salt water until a resistance of less than 30 ohms is obtained. Where there is no fear

that serious electrolysis will occur it is desirable to connect these grounds also to the rails, thereby providing a more effective ground for both the car and pole-line arresters. Where this might result in objectionable electrolysis this same connection may be made by a small fixed spark gap connected between the rails and the pipe ground. This gap should be made as small as possible.

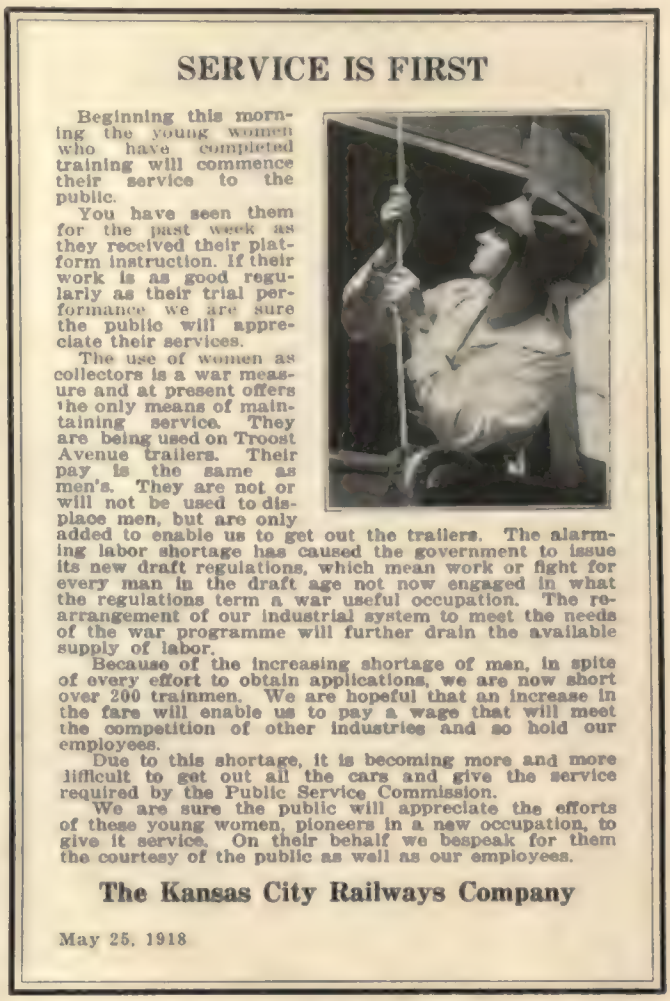
All the arresters described in this article are particularly suited for railway work in their proper applications, the electrolytic for station use, because of its high protective power in large sizes where maintenance questions are unimportant; the condenser and multipath types for car and pole-line use, in accordance with the severity of the conditions and the investment warranted.

Women Conductors in Kansas City, Kenosha and Camden

The Kansas City Railways Put on Five Women Conductors on May 21—Kenosha Conductors Strike With Men But Are Now Sorry—Some in New Jersey Also

THE Kansas City Railways Company on the morning of May 21, 1918, introduced women conductors to Kansas City. Eight women were put to work on the cars, each assisted on this first day by experienced older employees, five on the Rockhill and three on the Troost Avenue line. These lines are both comparatively short; they run through the best residence districts and both lines lead into the same division carhouse, at Forty-eighth and Harrison. On Saturday, May 25, the women were sent out alone.

The company does not intend to supplant men with women, except as it is unable to procure the men. These women were employed some three months ago when the service was down about 7 per cent. At that time the unions offered several objections. The women were in most cases retained in the employ of the company, the men having withdrawn their objections on the assurances that the employment of women was to improve service and not to lower wages. The women conductors receive the same wages as the men employed. The company will use them for the present only between the hours of 9 a.m. and 5.30 p.m., thus giving them only daylight runs. Rooms have been provided for the women near the carhouse at Forty-eighth and Harrison with a matron in charge. The women are making excellent conductors, being accurate, rapid, honest, and



ADVERTISEMENT CARRIED IN KANSAS CITY PAPERS ANNOUNCING THE PLAN





WOMAN CONDUCTOR UNDER INSTRUCTION—THE FIVE WOMEN CONDUCTORS EMPLOYED IN KANSAS CITY

having the faculty of tending strictly to business. The patrons seem pleased and the new conductors are meeting with every courtesy from the public.

WOMEN CONDUCTORS IN KENOSHA ON STRIKE

An interesting feature of the use of women conductors in Kenosha is that they are now on strike. The strike was not initiated by the women but they were drawn into it through a request of all of the employees for as high wages as are paid in Milwaukee and Racine where the railway systems are under the same management as in Kenosha. The increase asked was 10 cents an hour. The employing company, Wisconsin Gas & Electric Company, replied that the employees were entitled to the increase asked, but the company was unable to grant the increase because of inadequate revenues. The strike has been most orderly so far and the women seem disappointed that their new jobs have been discontinued. Service has not been resumed, the company waiting for action by the Council and Railroad Commission. The company has forty-four train employees, consisting of twenty-four women conductors and sixteen motormen on regular runs, and an extra board of two each. Eight single-truck cars are run regularly over five lines with a trackage of 7½ miles. On account of high operating costs and jitney competition, the company claims it cannot at this time afford to meet the increases which are suggested by the men and women.



WOMAN CONDUCTOR IN KENOSHA

Women were started as conductors on Dec. 20, 1917. The breaking-in period takes about a week on the car with a brief instruction course from the superintendent. The women range in age from twenty-five to thirty-five years. Twenty of them are married or widows, and six are single. Nine are the wives of employees. No male conductors are employed and no motorwomen by the company.

The motormen work nine hours a day, and on account of the laws of Wisconsin, the women conductors work in six-hour shifts as follows: 6 a.m. to noon, noon to 6 p.m. and 6 p.m. to midnight. Occasionally they get in twenty or thirty minutes overtime. If a woman conductor misses her run and the extras are all working, a regular works three hours on the open run, and as it is a six-hour shift it takes two conductors to finish the run. The rules, regulations, discipline and rate of pay per hour are the same as for the male employees. A bill was introduced in the last Legislature to prohibit the employment of women on street cars except from 8 a.m. to 5 p.m. but it was not passed. The Industrial Commission of Wisconsin has ruled that women conductors shall work only from 7 a.m. to 6 p.m. This will effectively eliminate them if the order remains unchanged, because they cannot be used during the rush-hour periods.

The women have been working without uniforms except a khaki cap with badge and a strap belt which holds the change carrier. They had ordered uniforms of khaki and were to pay $21 for them when the strike came. The women were in charge of a woman assistant superintendent. The cars are of the pay-as-you-enter type with a non-registering fare box of the company's own design and make.

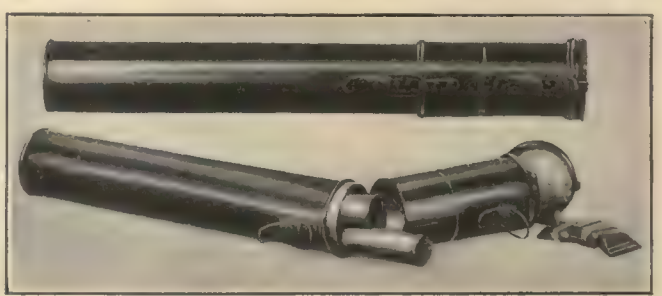
The women conductors report for duty and finish their platform work at the company's office. They are not allowed to go to the carhouse. The motormen run the cars to and from the carhouse which is only three blocks from the office. Public opinion in Kenosha has approved the use of women on the cars.

EXPERIENCE ON PUBLIC SERVICE

The Public Service Railway of New Jersey has had thirty-four women working for some time as conductors on its Southern division, with headquarters at Camden, and eight on its lines at Elizabeth. They have not been extended to other parts of the system yet, although the management sees no reason why they should not serve acceptably, and the company has trained some for use in Newark. There are matrons at each depot from which women conductors run and a minimum age limit of twenty-five years has been established.

Definite Location of Torpedo and Fuse Holder Prevents Delays

TO AVOID the bad practice, unfortunately found to prevail on many interurban lines, of carrying fuses of torpedos under car seats or in some indefinite place where there is likely to be considerable delay in obtaining them for use, a holder specially adapted to the requirements has been invented by M. F. Flatley, now master mechanic of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa. This holder as shown in the accompanying photograph, is a galvanized-iron tube 3 in. in diameter and 23 in. long, made with two compartments hinged together and with a hinged cover over the top. The bottom section is long enough to contain fuses of the standard length and the top section large enough to contain five or six torpedoes. Clip locks hold the two sections and the cover tightly closed and make the holder practically water-tight. Instead of putting the holder under a seat or in some inconvenient place, it is mounted in spring clips in the rear vestibule of the car so that when equipment is needed for the protection of a train, the conductor can grab up the tube and a flag and is then supplied with all the necessities with no loss of time. Patent has been applied for on this combination holder.



FUSE AND TORPEDO HOLDER FOR INTERURBAN CARS

Dipping and Baking Railway Motors Will Decrease Troubles

The Writer Describes the Apparatus Which Is Necessary for the Proper Dipping and Baking of Railway Motors and the Precautions That Should Be Taken to Secure the Best Results

BY J. V. DOBSON
Railway Engineering Department, Westinghouse Electric & Manufacturing Company

INTERRUPTED schedules in last winter's urban and interurban service force us to the question, "How can we best avoid another such epidemic of trouble?" Another winter may not be so severe; snowstorms may not affect the same localities as last year; the experience, however bids us to be alert in guarding against another such trial.

Where the dipping and baking process has been practiced, such precaution has been found to be very effective in eliminating the kind of trouble experienced because of the snow and water of last winter. The cost of rewinding armatures and fields as the result of last winter's severe snow conditions would far exceed the cost of dipping and baking outfits for the railroad shops of the whole country.

The dipping and baking treatment, when properly done, provides the best means for preventing insulation troubles caused by dirt and water in motors in service. This treatment, improperly given, is worse than none.

Applying a dipping and baking treatment after the motors have been in service will give renewed life to the insulation. It will close up cracks and pores, and will present a smooth, clean surface that is not readily harmed by dirt and moisture. Not the coils alone, but the whole piece, either armature or field, should be so treated.

The advantages of dipping and baking the complete piece are:

1. The coils are held in place in the slot securely and, therefore, are less subject to individual vibration.

2. All cracks between the coils are filled up, preventing the deposit of dirt or moisture.

3. Loose laminations are sealed and vibration prevented.

4. A coating which prevents rust is formed over the iron. On motors not so treated, it has been found that rust, which is a good conductor of electricity, is sometimes blown or thrown into the windings.

5. A smooth, dense surface layer is produced on the coils and on creepage surfaces.

6. The insulation of any coil which has been bruised in handling, during winding or assembling, is restored to good condition.

7. Any insulation on the field coils which is cracked by the strain of assembly will be sealed by the treating process.

8. The glossy covering produced will prevent the admission of water where the field coils are connected and taped.

One disadvantage in dipping and baking lies in the fact that it is more difficult to replace a coil. This, on the other hand, involves a counter advantage. The tightness which makes it difficult to remove also makes it proof against vibration, and seals it against moisture. A time-worn saying which holds good in some cases applies here, namely, "Make it difficult to repair and, when so doing, eliminate the need for repair."

Having shown the advantage of dipping and baking, it is my purpose to describe the design and building of a dipping and baking outfit that can readily be installed at any motor repair shop, with comparatively small expense. One outfit, of average size to fit the needs of a usual railway repair shop, will here be described.

How a Baking Oven of Average Size and Capacity May Be Constructed

What constitutes a dipping and baking outfit? It is neither a complicated nor expensive outfit to build. There are, however, certain necessary precautions in its design, and in its operation afterward, that should be observed.

The oven shown has walls of red brick and a roof of concrete slabs. The end doors, hinged and opening outward, are of sheet steel covered with asbestos. Door fasteners are provided. These should be arranged so as to permit opening from both the inside and outside—this is a "safety-first" measure. Tracks, as shown, are provided for running loaded trucks into the oven. These tracks are on a floor directly over the heating pipes, which occupy a chamber across the bottom of the oven. This arrangement gives the best results and insures a more nearly uniform temperature. Ventilating holes are placed at the top and inlet holes at the bottom. The size of the holes should be such as to give frequent changes of air in the oven. This is an important consideration, for vapor and volatile gases are driven off from the apparatus during heating, and unless these escape the heated air becomes wet and the baking process is rendered ineffective. Although not essential, a recording thermometer is advisable, because by its use a very close check can be made of the temperature of the oven at all times. In any case, when the oven is installed and before it is placed in service, very careful temperature readings should be taken at various heights to make sure that the temperature throughout the oven is uniform. Successful results can only be obtained by baking at a uniform temperature.

In more detail the steam coil shown consists of eighteen 1½-in. standard steel pipes, welded at each end into a 4-in. steel pipe. This method of construction has been found to be most satisfactory because it eliminates the use of threaded joints. There is always a risk of leakage of

steam at each threaded joint. Considerable precaution should be taken to prevent any steam leaks whatever in the oven. The pipes are set to drain at the inclination of 1 in. in 10 feet. The steam intake and outlet pipe is placed eccentrically in the 4-in. pipes to prevent the trapping of condensation. Electric heaters may be installed on the walls of the oven. These are to be used as auxiliaries, or at times when the steam is not available, and are not absolutely necessary.

Other ovens, of a less permanent nature, can be constructed. For example: I have seen a boxcar removed from its wheels, doors made at each end, walls lined with asbestos and pipes installed along the side near the bottom. It made a very satisfactory baking oven. A rectangular box of wood 2 in. thick, lined with asbestos and provided with heating elements can be well utilized. It is, however, quite evident that a well-designed oven of sufficient capacity and with adequate means of handling the apparatus will give the best results, but at a little higher first cost of installation.

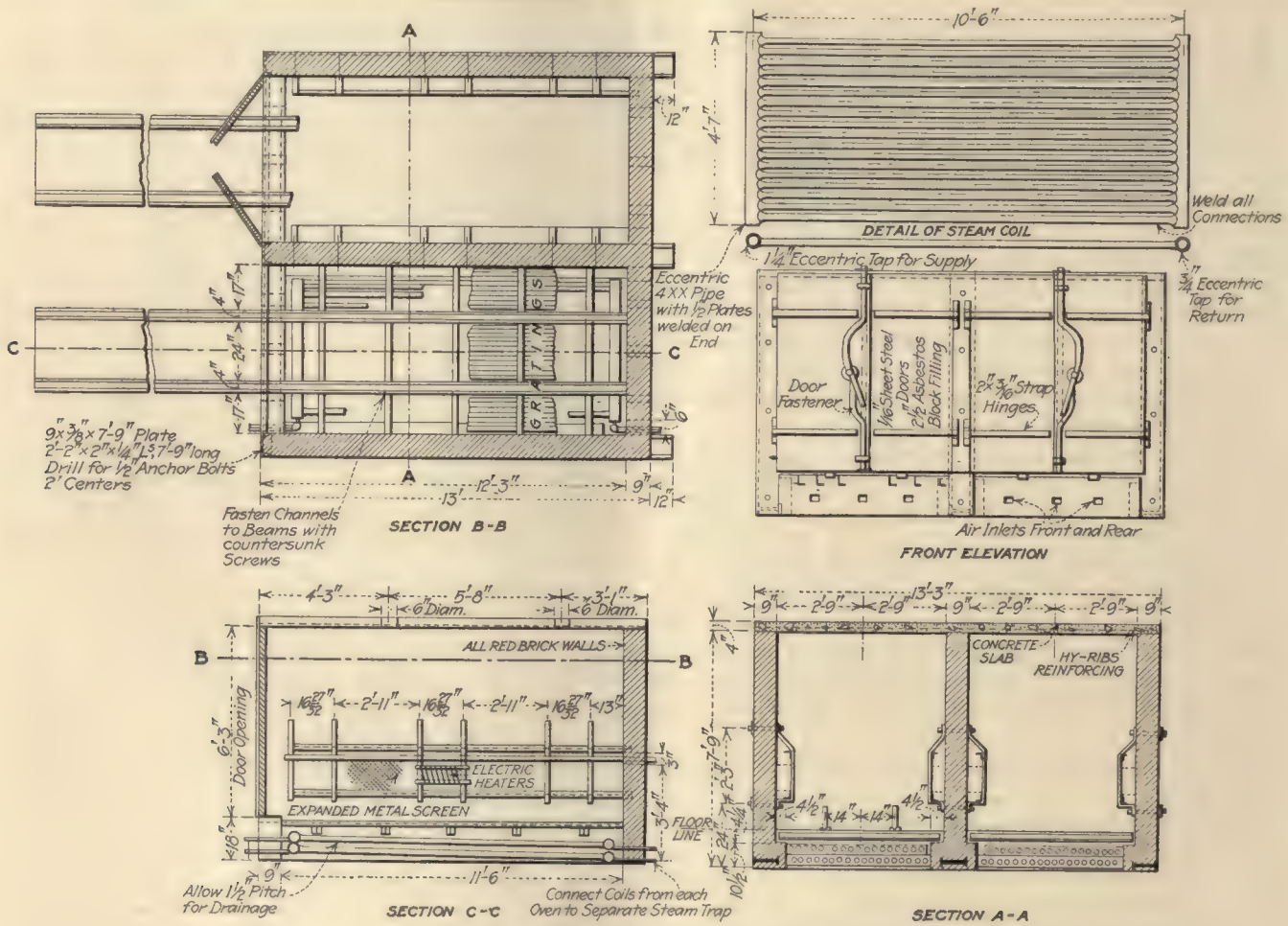
For some installations electric heaters may be cheaper and more convenient than steam heating. Discarded car heaters have been found to work quite satisfactorily. When such heaters are used they should be placed on the bottom of the oven, as in the manner herein described for steam heaters.

Most dipping and baking compounds require benzine to dilute them. It is therefore advisable to place the dipping tank in a shed or outhouse, apart from the main shop, where fires or sparks may be excluded, and where, should a fire occur, it is so remote from the main shop that the main building is not endangered. The size of the dipping tank, of course, is dependent on the size of the motors that are to be dipped.

The tank can very easily be made of sheet metal of a thickness sufficient to retain the dipping compound without buckling. It should be made water-tight by welding the edges. Some tanks have been equipped with covers that are released in case of fire by the melting of a fusible wire, thus releasing a latch and dropping the cover, which quickly smothers the flame. Where large tanks are used with heavy covers, it is somewhat more convenient to make the cover removable altogether. Should a fire occur, a valve is immediately opened, and in a very short time the dipping compound is emptied into the cistern.

It is necessary, of course, to provide means for handling the apparatus. This, however, can be modified to fit the conditions of the particular shop. It should be pointed out that an electric hoist is not as safe as an air or chain hoist in the vicinity of the dipping tank. Whatever vaporization of the benzine takes place ascends above the tank and produces an explosive mixture. A slight spark from the motor may be the means of igniting such a mixture. An approximate cost of this dipping and baking outfit, equipped, would be $1,200.

All oil, grease and dirt should be removed from the apparatus before it is dipped. This can best be done



DETAILS OF A BAKING OVEN

by blowing it with clean, dry compressed air. In the event of an accumulation of grease or oil in large quantities, this can easily be removed by scrubbing the surface of the apparatus with a cloth wet with benzine or gasoline.

The piece should then be heated for approximately six to eight hours in the oven in order to drive off all moisture, and to open up the pores in the insulation. This heating should be continued until the apparatus has reached a temperature of about 100 deg. C. It is then removed from the oven and taken to the dipping tank. If by that time its temperature has not dropped to between 40 deg. and 60 deg. C. it should be allowed to stand until that temperature is reached. If dipped at a temperature above this, quick evaporation of the benzine occurs. It will be realized that benzine is very volatile and that it has a lower boiling point than water.

An oil-proof and moisture-proof baking and insulating varnish should be used, and care should be exercised to use it at the following specific gravity: 0.850, at 15 deg. C.; 0.846, at 20 deg. C.; 0.840, at 25 deg. C.; 0.840, at 30 deg. C. Use benzine to thin the liquid.

The dipping should not be done with the temperature of the liquid below 15 deg. C., as varnish at that temperature becomes too hard and is not homogeneous.

Dip both the armatures and fields in a vertical position. Armatures should be dipped with commutator end down, so that all of the windings are totally immersed. They should remain in this position for twenty or thirty minutes, or until all signs of bubbling cease. Dip the fields and frame with pinion end down, so that the varnish will not cover the brush-holder pads.

Entire Motor Frame Should Be Dipped

In connection with the dipping of the fields, very much better results are obtained if the whole piece is dipped, rather than by treating the coils individually. The reason for this is that the connections to the coils are made after the coils have been bolted in place in the frame. This bolting has a tendency to distort the insulation and may cause cracks, so that if the whole piece is dipped these cracks are filled up and a smooth surface is obtained. Then, too, the joints themselves are covered with a glossy, smooth surface which prevents water from getting in at this point and creeping down between the insulation and the copper, thereby making the insulation "spongy." It will, of course, be necessary to clean the frame, both inside and outside, before such dipping is done. Some may prefer to dip the field coils separately, which is much better than not treating them at all, but it is not so good as dipping the whole field.

Another reason in favor of dipping the whole field is that the painting of the inside of the frame can thereby be eliminated. This painting, which is done to prevent rust and condensation, has become the regular practice in some repair shops. Dipping is very much quicker and more effective than the painting. The secret of effective dipping is to get the insulation well saturated with the varnish and to fill up all the air pockets and cracks. The apparatus should remain in the tank until it is certain that all bubbling has ceased. If this is not done, baking will cause the gases and the air to expand in the air pockets, breaking through the insulation and leaving small pin holes through which moisture can easily enter.

Drain both the armatures and the fields in a vertical position. This is in order that all of the surplus varnish may drip off and may not settle in pockets where, during the baking process, it will not bake out properly. This draining is an important consideration in dipping armatures, because if it is not done properly very serious unbalancing may occur. It is essential that the balance of the armatures should be just as good after dipping as before. After the apparatus has drained for some time the varnish should be removed from all polished or wearing surfaces. This can easily be done by rubbing with a rag, wet with benzine.

Baking Should Not Be Hurried

Place the armatures and fields in a vertical position in the oven and bake at 95 deg. C. between the limits of a minimum temperature of 90 deg. and a maximum of 105 deg. C. Baking vertically, as in draining, is to prevent the deposit of varnish in pockets which would cause improper drying and unbalancing.

Bake until dry. This is one of the first essentials for successful treatment and one that is most likely to be slighted because of the time involved in the baking oven. Too many are prone to rush the baking period. This is accompanied by unsatisfactory results. The best way to determine if the baking is sufficient is to break off the strings that form at the bottom of the apparatus. If these are baked through then it is a good indication that the baking has progressed far enough. An approximate baking period for armatures and fields of 15-in. to 20-in. diameter will be sixty hours at 90 deg. C. The result of the baking should be a smooth and glossy surface without cracks and with all openings sealed up.

It is possible to reduce the baking period by increasing the temperature. If this is done, extreme precaution should be observed to see that the temperature does not go above 130 deg. C., since injury to the insulation may otherwise occur. If steam heat is used in temperatures above the boiling point of water, saturated or superheated steam is necessary. For a general application, a longer baking period at a lower temperature is to be recommended.

Proper Precautions Insure Efficient Results

In building the oven:

1. Place heating elements at the bottom of oven.
2. If steam is used provide against any possible leak in the oven.
3. Arrange the heating pipes so that the condensation will drain away.
4. Provide for the ventilation of the oven.
5. Provide a thermometer, a recording thermometer preferably, so that the temperature of the oven may be known.
6. Safety first.

In building the tank:

1. Avoid having the tank near sparks or fires.
2. Do not use an electric hoist above the tank because a spark is liable to ignite the gases.
3. Provide a cover to prevent the evaporation of the solvent and to keep out dirt at such times when the tank is not in use.
4. Provide for drainage; a rack directly above the tank and draining into it is very satisfactory.

In dipping and baking:

1. Improper treatment is worse than no treatment.

2. Cleanliness is necessary. Remove dirt and grease.

3. Use a dipping and baking insulating varnish; in other words, use good varnish in the treatment.

4. Observe the specific gravity and temperature of the varnish.

5. Dip until thoroughly saturated.

6. Bake until dry.

7. Make sure that the temperature is uniform in the oven and that it is the correct temperature.

8. Do not exceed 130 deg. C. at any time, else injury to the insulation may result.

9. Do not interrupt the baking period.

10. Remove the varnish from all polished or wearing surfaces, armature bearings, commutator, brush-holder pads, or housing seats.

11. Do not smoke.

Specifications for Cedar Poles

AT ITS last convention the Western Red Cedar Association adopted standard specifications for Western red cedar poles 4 in. and 20 ft., and larger. One of the principal changes made is the fact that the association now grants a minimum measurement at the extreme butt on poles 35 ft. in length and longer. The complete specifications as revised on April 30, 1918, follow:

1. *Live Timber:* All poles must be manufactured from live growing cedar timber.

2. *Manufacture:* All poles must be peeled, knots trimmed close and butts and tops sawed square.

3. *Variation in Length:* Poles may be 6 in. longer or 3 in. shorter than length specified.

4. *Knots:* Knots are not a defect, if sound, trimmed smoothly and do not plainly impair the strength of the pole.

5. *Discoloration:* Discoloration is not a defect.

6. *Miscellaneous Defects:* No poles shall contain sap rot, woodpecker holes, plugged holes or evidence of having been eaten by ants.

7. *Rot:* Tops of poles must be free from rot. Butt rot in center, including small ring rot, shall not exceed 10 per cent of the area of the butt. Butt rot of a character which impairs the strength of the pole above the ground line is a defect.

8. *Cat Faces:* Sound cat faces are not a defect if no part of the cat face shows on the upper one-fifth of the length of the pole or within 2 ft. above or 1 ft. below the ground line.

9. *Dead or Dry Streaks:* A sound dead or dry streak is not a defect if it does not cover more than 25 per cent of the surface of the pole at any one point.

10. *Minimum Measurements:* (a) The tops of all poles shall have a minimum circumference measurement as shown in table No. 1. (b) The extreme butt of all poles shall have a minimum measurement as shown in table No. 2. (c) Poles having a decided swell or flare at the butt shall have a sufficiently larger measurement at butt to insure a reasonable measurement at the ground line.

11. *Short Kinks:* Short kinks are not permitted.

12. *Reverse Sweep:* Reverse sweep and two-way sweep, meaning a sweep in two planes, is permitted, provided a straight line drawn from the center of pole at top to center of pole at ground line does not leave the pole at any point.

13. *One-Way Sweep:* One-way sweep is permitted provided it does not exceed maximum shown in table No. 3.

14. *Method of Measuring Sweep:* That part of the pole below the ground line not to be taken into consideration. Tightly stretch a tape line from point at the ground line (see paragraph 15) on the side of the pole where the sweep is greatest to the upper surface at the top of the pole, and, having so done, measure widest point from tape to surface of pole and if, for illustration, upon a 30-ft. pole the widest point does not exceed 4 in., this pole shall be accepted.

TABLE I. MINIMUM TOP MEASUREMENT

Top Designation, In.	Circumference, In.	Top Designation In.	Circumference In.
4	12	8	25
5	15	9	28
6	18½	10	31
7	22		

TABLE II.

Poles 35 ft. and longer shall have a minimum circumference measurement at extreme butt as follows:

Length, Ft.	7-In. Top, In.	8-In. Top, In.	9-In. Top, In.	10-In. Top, In.	Length, Ft.	8-In. Top, In.	9-In. Top, In.	10-In. Top, In.
35	33	36	39	42	65	45	48	51
40	34	37	40	44	70	47	50	53
45	..	39	42	45	75	48	51	54
50	..	41	44	47	80	50	53	56
55	..	42	45	48	85	51	54	57
60	..	44	47	50	90	52	55	58

TABLE III.

Length of Pole, Ft.	Maximum Sweep Between Top and Ground Line, In.	Length of Pole, Ft.	Maximum Sweep Between Top and Ground Line, In.
20	3	60	9
25	3½	65	10
30	4	70	10½
35	5	75	11
40	5½	80	12
45	6	85	13
50	7	90	14
55	8		

15. *Explanation of Term "Ground Line":* The term "ground line" as used in these specifications shall mean a point on the pole a distance of 4 ft. on 20-ft., 5 ft. on 25-ft. and 30-ft., and 6 ft. on 35-ft. and longer poles from the extreme butt.

Connecticut Company's Power-Saving Campaign Produces Results

IN COMMON with many other electric railways the Connecticut Company, has had in operation for some time an energetic campaign for reducing power consumption on its cars. The platform men are carefully instructed as to proper handling of controllers and brakes and their work is systematically checked. The Arthur "power-saving recorder" is generally used on the system in checking the performance of the men. Through the courtesy of L. S. Storrs, president of the Connecticut Company, it is possible to give the comparative figures of energy consumption on all divisions of the property for the month of April in 1917 and 1918. These are as follows:

RESULTS OF CAMPAIGN FOR ENERGY-SAVING (TRACTION ONLY) CONNECTICUT COMPANY

Division	Kilowatt-Hours per Car-Mile 1917	1918	Per Cent. Decrease
New Haven	3.240	2.876	11.23
Waterbury	4.378	4.093	6.51
Hartford	3.831	3.167	17.33
New Britain	3.305	3.114	5.78
Bridgeport	4.024	3.186	20.83
Meriden	3.157	2.575	18.44
Middletown	4.542	3.524	22.41
Stamford	3.844	3.266	15.04
Norwalk	3.140	2.499	20.41
Torrington	2.008	1.688	15.94
Derby	3.933	3.711	5.64

The company credits the above very creditable showing to the energy-saving campaign as a whole, the use of the checking device being one element, but an important element, of this campaign.

To protect the health of workers and others in this country at a time when the labor of every man possible is needed, Secretary McAdoo has directed that the United States Public Health Service give anti-typhoid inoculations without charge to all who apply to any of its hospitals or field offices.

CARNEGIE LIBRARY

Interurban Car Built for Hospital Service at Chicago

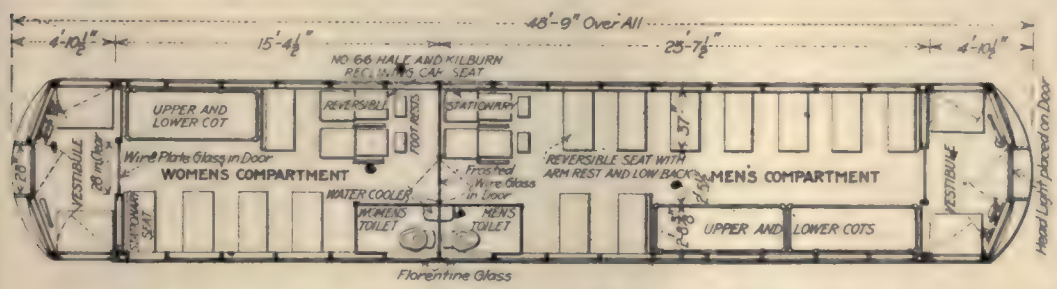
Separate Compartments Are Provided for Men and Women With All Conveniences for Comfort While in Transit

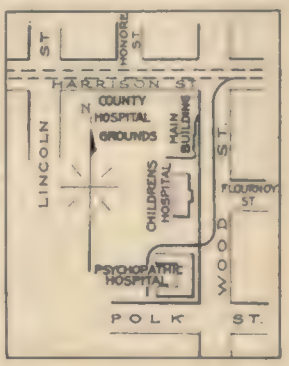
A HOSPITAL car, built for Cook County, has just been turned out of the West Shops of the Chicago Surface Lines. This car will be used in transporting patients from the Psychopathic Hospital in Chicago to the State institutions at Dunning and near Kankakee, Ill., and will be operated by the street railway companies. It was built for the purpose of giving patients as much comfort as possible while in transit, as well as allowing them more privacy than the ordinary cars afford. It also does away with unnecessary transferring from one vehicle to another. It is likely that arrangements will be made later to operate the car over the tracks of the Aurora, Elgin & Chicago road to the State institution at Elgin. A single-track connection has been built recently from the line on Harrison Street into the grounds of the Psychopathic Hospital. This permits operating the car directly to the hospital and facilitates the loading and unloading of patients.

The car has the general appearance of the standard cars of the Chicago Surface Lines. It also resembles an interurban car in equipment and has Pullman type trapdoors and platform. It is divided into two compartments, one for men and one for women. The former seats twenty persons and includes two reclining chairs for semi-invalid patients, while two upper and lower level folding berths are provided for other patients. Regulation Pullman curtains inclose these berths. The women's compartment has ten regular seats, two reclining chairs and one double berth. There is a Duner flush toilet in each compartment.

The supporting framework for the folding berths is constructed of white enameled pipe. This gives a very clean and sanitary appearance to the berths and at the same time provides a construction that is strong and easy to install. The details of this framework are shown in an accompanying illustration.

The windows have heavy screens inside, as well as the usual screens outside, and the doors and upper sash of each window are glazed with wired plate glass. These precautions were taken to safeguard the patients against broken glass. The seats, furnished by the Hale & Kilburn Company, are covered with dark-green leather.





GENERAL ARRANGEMENT OF HOSPITAL CAR, CHICAGO SURFACE LINES. AT RIGHT, SINGLE-TRACK CONNECTION FOR ENTERING GROUNDS OF PSYCHOPATHIC HOSPITAL



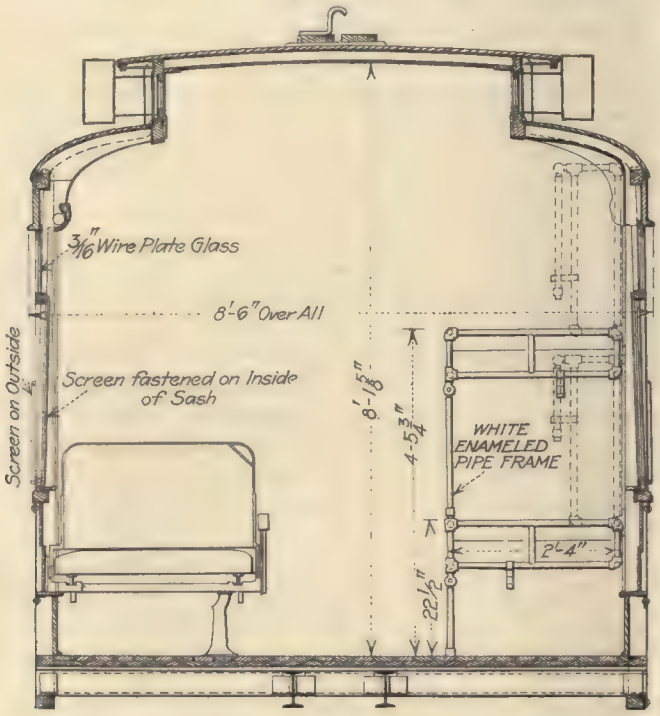
EXTERIOR OF CAR WITH WIRED-GLASS WINDOWS AND PROTECTING SCREENS



INTERIOR OF CAR SHOWING POSITION OF BERTHS AND RECLINING SEATS

The Ohio Brass Company furnished a lighting system so arranged that the marker lights and an emergency light in each compartment will burn when the trolley leaves the wire. These markers and emergency lights are operated from a storage battery.

The car has an arc headlight provided with dimmers for city use. The Pantasote curtains and fixtures were furnished by the Railway Supply & Curtain Company. The Consolidated Car Heating Company provided the heaters, which have sufficient capacity to raise the temperature of the car to 65 deg. with an outside temperature of 10 deg. Railway Utility Company's thermo-



SECTION OF CAR SHOWING FRAMEWORK FOR SUPPORTING BERTHS

static control is provided. The ventilating system is of the exhaust type, also provided by the Railway Utility Company. O. M. Edwards trapdoors are used on each end of the car, and both vestibules are arranged with end doors so that invalid patients can be carried in or out on a stretcher. Water tanks for the toilet can be filled from a hose connection at the side of the car under the sill, an overflow being provided at the roof.

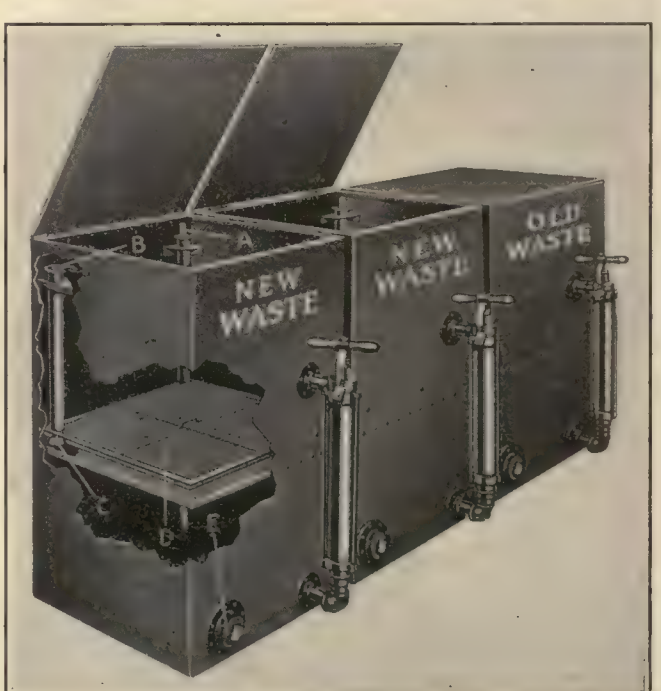
The wheels have a 3-in. tread with a ¾-in. flange. They are of the A.E.R.A. interurban standard and may be used on the city tracks as well as those of the Chicago & Interurban Traction Company on trips to and from Kankakee. The trucks are of the M.C.B. type furnished by the McGuire-Cummings Manufacturing Company. The car is equipped with four GE-210 motors, with a gear ratio of 24: 63. This is the same as the motor equipment and gear ratio of the Kankakee interurban cars. It has General Electric P.C. control, and a G.E. CP-27 air compressor.

The car is painted with the Surface Lines standard green, trimmed with red on the outside, while the interior is finished in cherry with headlining of birch veneer and sheet steel grained to match the birch. The floor is of maple, varnished. The car has a steel underframe and sides, and a double bumper at each end to meet the different levels of city and interurban cars. H.B. fenders are used. The plan and section give the principal dimensions. The complete weight of the car is 61,000 lb.

Increased Car Mileage Per Packing Results from Efficient Saturation of Waste

A FURTHER development has been made in the journal waste saturation equipment of the Milwaukee Tank Works so that mileages of 10,000 and even 15,000 between packings are said to be by no means uncommon. It is reported that one large railway has arranged to run its cars 20,000 miles between refillings of the journal boxes.

The new equipment is shown in the accompanying cut. The oil is kept in the lower compartment and the waste to be saturated is placed on the screen *D*. The oil is then drawn from the lower compartment by means of the pump and the waste is completely submerged. After the waste has remained in this condition for from eighteen to twenty-four hours, the handle *B* is turned and the oil drains down through the screen and back to the lower compartment through the valve *C*. After the waste has drained for about twenty-four hours it is said to be perfectly saturated but free from surplus oil. The



EQUIPMENT TO PROVIDE PROPER SATURATION OF JOURNAL WASTE

gage stick *A* shows the quantity of oil in the lower compartment, and the opening *F* is for cleaning or inspection.

These tanks are of the Milwaukee "Kant-Leek" construction, of heavy metal, closely riveted and hard soldered. All upper compartments have removable screens, dustproof covers and improved train valves. The two compartments shown at the left are for the saturation of new waste, while that shown at the right is for resaturation of old waste. Thus the oil from the old waste is kept separate from that used with the new, which has been found of great advantage.

LETTERS TO THE EDITORS

E. H. McHenry's Contribution to Single-Phase Development

WATERBURY, CONN., June 5, 1918.

To The Editors:

As I opened the June 1 issue of the ELECTRIC RAILWAY JOURNAL and on page 1043 noted the portal view of the southern end of Little Hell Gate bridge, with its overhead catenary construction, and the caption at the head of the article, "11,000-Volt Overhead on the New York Connecting Railroad," a flood of memories came over me. Notwithstanding the intensely interesting nature of the problems of hydroelectric development and power conservation here in Connecticut which occupy me now, my twelve years with the New Haven Railroad left an eradicable impress.

The fundamentals of the single-phase system and its single contact wire etched themselves deeply into my mind as I studied their constructive applicability. It was clear to me in the early days that a single contact line with 25-cycle power provided the most flexible and economical means of producing traction in any form of speed-torque arrangement that the exigencies of the case demanded. From this single wire could be produced the split-phase power of constant-speed characteristics, the single phase offering the variable speed movement, and a rectifier or motor-generator furnishing direct current if a case for this could be made out. As developments have gone on I have found no reason to change my conclusion relative to the superiority of the single-phase system over that of the direct-current system, notwithstanding the later higher reaches in voltage that have been secured with the direct current.

However, my purpose in writing is not to review the arguments in favor of single-phase traction but rather to point out how the pictures of the New York Connecting Railroad electrification reflect the genius of E. H. McHenry, both as to imagination and practical applications, for as in so many of the other standards, the designers here have adopted his scheme of contact wire in the use of a clip-suspended wire hung from and parallel to the conductor immediately above it.

I have in my possession five mussy little sheets of yellow paper which contain memoranda and sketches prepared by Mr. McHenry probably in the latter part of 1907. This was just prior to the authorization of the board of directors of the New Haven road which granted us $50,000 for an experimental line of four-track catenary construction, there having been granted also at the same time an appropriation to cover an experimental electric freight engine. I recall that it was with these little yellow sheets in hand that I discussed with my chief draftsman the catenary drawings later developed in connection with the New Haven electrification. The final plans worked out and applied on the New Haven conformed very closely to those covered by the original memoranda.

Among the advantages noted by Mr. McHenry at the time with regard to this form of construction were these: Lateral stability of catenary at center spans; lateral stability of conductor and running wire at bents; elimination of strain and pin insulators; grounding of main catenary system; removal of main cables and insulators from position over track centers; elimination of pull-offs on light curves; reduction of weight and cost; increased flexibility and adjustability; substitution of cross catenary for fixed spans, and lightning protection.

To him belongs the credit of the elimination of pull-offs on curved catenary construction, for it was he who suggested the graceful catenary support by means of which the contact wire has been made to conform closely to the curvature of the track while still maintaining a constant vertical distance from it. In these memoranda Mr. McHenry suggested the substitution of cross catenary for fixed spans. We originally intended to use this plan but for certain reasons later decided against it.

In connection with the application of the catenary supports to curved track came the problem of designing a hanger to keep the two closely adjacent and parallel wires in a plane vertical with each other. I was fortunate enough to apply the whiffletree scheme of support in this case. This support, by the way, was the only device patented by me out of the large number produced in connection with the New Haven electrification. I was gratified to note in this same article that the New York Connecting Railroad's consulting engineers, Gibbs & Hill, used Mr. McHenry's form of catenary support on curves and the hanger above mentioned.

One of the traits pronouncedly developed in Mr. McHenry is to give rather than to take credit. While his partner I would have hesitated to write the above, but the case is different now as Philadelphia, where Mr. McHenry resides, is a long way from Waterbury and should he hear about this I shall still have a fighting chance.

W. S. MURRAY.

There Is a Great Opportunity Now to Stimulate Standardization

INDIANAPOLIS TRACTION & TERMINAL COMPANY

INDIANAPOLIS, IND., May 29, 1918.

To the Editors:

I have been greatly interested in the discussion on track spiral standardization which has been going on recently in the columns of the ELECTRIC RAILWAY JOURNAL. Aside from the technical aspects of the question there is one which might well be emphasized at the present time. This is that now is an excellent time to get rid of certain faulty engineering habits. Part at least of the bad habits in designing that have become rather prevalent are due to the desire of the engineer to impress his personality on his designs. The result has been a lot of individuality in these designs, tending away from standardization and involving unnecessary expense. The exigencies of war time have forced us to consider every imaginable economy, and the cheapening of special work is a possibility in this line. Let us therefore give up some of our pet hobbies, if necessary, and join in the movement for simplification.

It ought to be possible to order a track spiral, for example, from any manufacturer by the same number, and a few standard sizes should suffice.

THOMAS B. MCMATH, Chief Engineer.

Simplicity in Track Spiral Standards Is Desirable

BOARD OF SUPERVISING ENGINEERS,
CHICAGO TRACTION

CHICAGO, ILL., May 29, 1918.

To the Editors:

In connection with the discussion which has been going on for some weeks in the columns of the ELECTRIC RAILWAY JOURNAL on the subject of track spiral standardization, there are several points which I believe should have due consideration. The principle of standardization is the correct one wherever conditions are such as to make it practicable. For example, a few rail sections which could be rolled at a lower price per ton due to the use of acceptable standard sections, would certainly be preferable to the present multiplicity of sections.

A reduction in the number of standard spirals, or more properly, easement curves, should conduce to economy in the manufacture of special work and hence to a decrease in selling price.

At the same time it must be remembered that simplicity is a very desirable feature in any standards that may be proposed. The number of circular arcs making up the easement curves should be as small as possible. It is not necessary or possible to have a theoretically true spiral which changes its curvature at every point. The fact is that any curve which looks smooth to the eye, one free from "kinks" or sudden changes in curvature, will guide a car with comfort to the passengers and little jar to the equipment.

Mr. Angerer's views on this subject appeal to me as reasonable. While he writes from the standpoint of the manufacturer, he has the welfare of the railway in mind also. He would be the last man in this field to recommend anything but what he believes to coincide with the best practice from the operating side. Hence his suggestion that fewer and longer arcs be used than those listed in Mr. Ryder's article should be given great weight.

In Chicago we use Pennsylvania Steel Company's spirals on ordinary curves and standard switch spirals of the general character illustrated in the accompanying drawings. Fig. 1 shows standard easement spirals Nos. 4, 5 and 6. These are used on inside curves with track centers or 10 ft. 2 in. or more and are, in fact, the most generally used by us. Table I contains the elements for the curves of Fig. 1. Fig. 2 is a typical branch-off used by us for inside clearance curves with

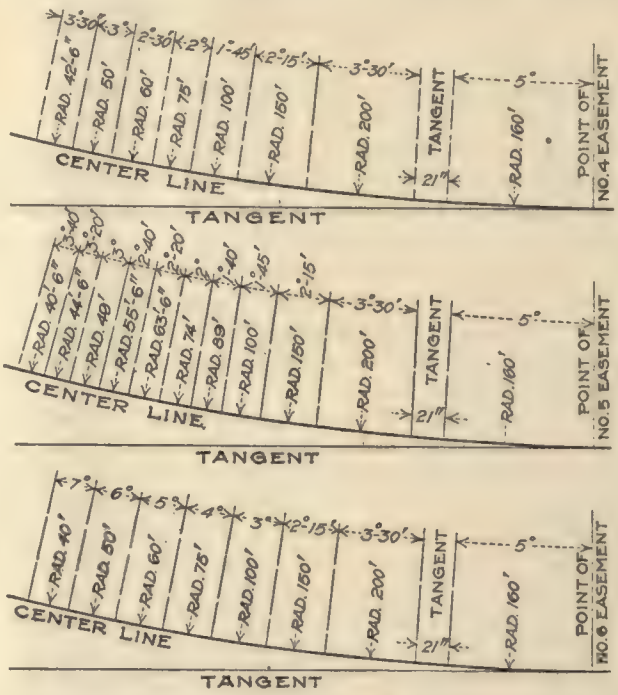


FIG. 1—STANDARD EASEMENT CURVES, CHICAGO SURFACE LINES

TABLE I—STANDARD EASEMENTS, CHICAGO SURFACE LINES
(See Fig. 1)

(For significance of Symbols, See Fig. 2)

Elements of Easement No. 4

Radius	Total Angle	X	Y	O G	G S
160 ft., 0 in.	5° 00′	0.600	13.740	.....	.....
.....	.....	0.752	15.483	.....	.....
200 ft., 0 in.	8° 30′	2.171	27.471	197.646	—1.743
150 ft., 0 in.	10° 45′	3.140	33.187	148.195	5.647
100 ft., 0 in.	12° 30′	3.741	36.108	99.073	14.974
75 ft., 0 in.	14° 30′	4.333	38.574	74.665	20.385
60 ft., 0 in.	17° 00′	5.016	40.994	60.143	24.140
50 ft., 0 in.	20° 00′	5.808	43.360	50.580	27.064
42 ft., 6 in.	23° 30′	6.716	45.637	43.533	29.629

Elements of Easement No. 5

Radius	Total Angle	X	V	O G	G S
160 ft., 0 in.	5° 00′	0.600	13.740	.....	.....
.....	.....	0.752	15.483	.....	.....
200 ft., 0 in.	8° 30′	2.171	27.471	197.646	—1.743
150 ft., 0 in.	10° 45′	3.140	33.187	148.195	5.647
100 ft., 0 in.	12° 30′	3.741	36.108	99.073	14.974
89 ft., 0 in.	14° 10′	4.323	38.559	88.334	17.354
74 ft., 0 in.	16° 10′	4.977	40.974	73.790	21.025
63 ft., 6 in.	18° 30′	5.719	43.351	63.705	23.949
55 ft., 6 in.	21° 10′	6.558	45.678	56.118	26.487
49 ft., 0 in.	24° 10′	7.499	47.931	50.057	28.834
44 ft., 6 in.	27° 30′	8.567	50.138	45.951	30.677
40 ft., 6 in.	31° 10′	9.763	52.265	42.403	32.524

Elements of Easement No. 6

Radius	Total Angle	X	Y	O G	G S
160 ft., 0 in.	5° 00′	0.600	13.740	.....	.....
.....	.....	0.752	15.483	.....	.....
200 ft., 0 in.	8° 30′	2.171	27.471	197.646	—1.743
150 ft., 0 in.	10° 45′	3.140	33.187	148.195	5.647
100 ft., 0 in.	13° 45′	4.225	38.183	99.073	14.974
75 ft., 0 in.	17° 45′	5.601	43.063	74.789	20.916
60 ft., 0 in.	22° 45′	7.342	47.781	60.503	25.489
50 ft., 0 in.	28° 45′	9.509	52.273	51.281	29.356
40 ft., 0 in.	35° 45′	11.962	56.160	42.514	34.166

TABLE II. STANDARD SPIRALS, CHICAGO SURFACE LINES
(Used in making up the branch-off shown in Fig. 2)

Elements of Spiral No. 2

Inside Radius	Total Angle	X	Y	O G	G S
297.646	0° 30′	0.011	2.597	.....	.....
147.646	1° 30′	0.056	5.173	147.652	1.309
97.646	3° 0′	0.157	7.728	97.669	2.618
72.646	5° 0′	0.333	10.258	72.703	3.926
57.646	7° 30′	0.607	12.758	57.760	5.234
47.646	10° 30′	0.997	15.222	47.845	6.539
40.146	14° 0′	1.517	17.618	40.471	7.906
35.146	18° 0′	2.194	19.976	35.619	9.115

Elements of Spiral No. 2½

Inside Radius	Total Angle	X	Y	O G	G S
441.646	0° 20′	0.007	2.569	.....	.....
219.645	1° 0′	0.038	5.125	219.649	1.292
145.646	2° 0′	0.104	7.666	145.661	2.583
108.646	3° 20′	0.222	10.191	108.683	3.874
86.646	5° 0′	0.405	12.705	86.722	5.154
71.646	7° 0′	0.666	15.191	71.778	6.461
61.146	9° 20′	1.020	17.656	61.356	7.740
53.146	12° 0′	1.478	20.087	53.462	9.038
46.646	15° 0′	2.048	22.461	47.105	10.389
42.146	18° 20′	2.751	24.810	42.757	11.554
38.146	22° 0′	3.592	27.101	38.960	12.812

Elements of Spiral No. 3

Inside Radius	Total Angle	X	Y	O G	G S
297.646	1° 0′	0.046	5.195	.....	.....
147.646	3° 0′	0.226	10.345	147.669	2.618
97.646	6° 0′	0.626	15.442	97.737	5.235
72.646	10° 0′	1.332	20.462	72.874	7.848
57.646	15° 0′	2.421	25.373	58.102	10.452
47.646	21° 0′	3.962	30.115	48.443	13.041
37.646	28° 0′	5.867	34.298	39.107	16.624

9-ft. 8½-in. track centers. This curve is made up to use Pennsylvania standard spirals Nos. 2, 2½ and 3, the elements of which are given in table II. It may be interesting to note that between the 5 deg. of 160-ft. radius curve and the spiral we use a stretch of tangent track. This, we think, gives us a more durable switch point and mate and there is no discomfort in

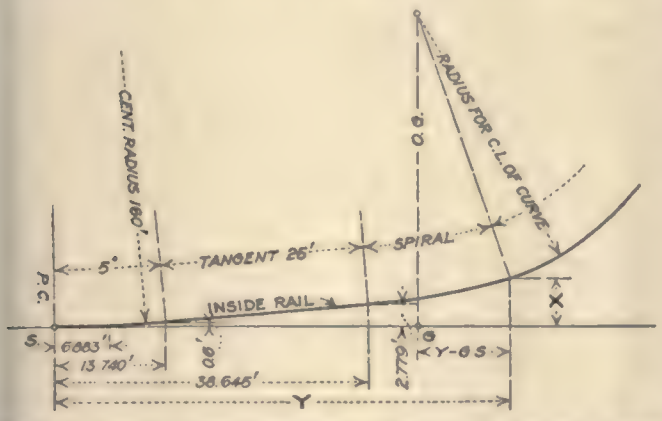


FIG. 2—TYPICAL BRANCH-OFF, CHICAGO SURFACE LINES

taking the curve over such a piece of special work. We make all double-track curves in Chicago clearance curves as we feel that the saving in time of the cars in rounding curves more than compensates for any extra expense of installation. In some cases it has been necessary to cut a little off from the sidewalk at the corner, but never enough seriously to narrow the walk. GEORGE WESTON, Engineer for Board.

AMERICAN ASSOCIATION NEWS

War Board Holds Busy Session

Interurban Rates, Transportation of Draft Men to Cantonments and Other Topics Discussed

AT a meeting of the American Electric Railway War Board held in Washington on June 7 considerable progress in a number of matters of interest to electric railways was reported. The full board was in attendance with the exception of Chairman McCarter, who was detained in Newark. Secretary Burritt and Messrs. Faber and Hill were also present.

Mr. Faber reported in detail upon the increase in steam railroad rates which had recently been announced and upon the effect which this increase would probably have upon the electric roads. He described the reasons for the letter sent by the War Board on May 31 to the interurban railways, mentioned on page 1100 of the issue of this paper for last week, and explained that the United States Railroad Administration hoped that the electric railways would take immediate steps to bring their rates to a parity with the new government rates and to make the new rates effective simultaneously therewith, although he explained that it was realized that there might be cases where local conditions made such an increase undesirable. Mr. Faber also spoke of correspondence which the board had had with the Railroad Administration on the subject of commutation rates, on which the advance on the steam railroads has been less in proportion than on other passenger rates. He reported that the Electric Railway War Board was working in close touch with the Railroad Administration and that pleasant relations existed between the staffs of both organizations. The War Board adopted a resolution thanking Mr. Faber for his work in this matter.

The results were also reported of the conference recently held in Washington between the traffic representatives of a number of the principal interurban electric railway lines in Ohio, Indiana, Illinois, Michigan and Wisconsin and the government to determine what proportion of the transportation required to cantonments by the men concerned in the present draft could be handled in those states by the interurban electric railways. On account of the congestion on the steam railroads, the government had indicated that it would be glad to have the electric lines take over all of this traffic which they are able to handle. If no through electric routes are available, the governnent's suggestion is that the electric lines will be used to convenient junction points with steam railroads, provided the facilities of the electric lines are adequate to afford the services required for the entire movements and provided the steam trains later used do not originate at the same points as the electric trains.

The War Board has been requested by the official in charge of draftees for information pertaining to the ability of electric lines to handle movements, prior to the issuance of government orders. Preliminary reports of this kind from the roads affected are now in the hands of the War Board and are being checked up for final submission to the government, F. W. Shappert, traffic and industrial agent Chicago, North Shore & Milwaukee Electric Railroad, who had been in attendance at the conference, explained to the War Board how the estimate by the different roads had been made up. In all cases the estimates were based on the use of the most natural routes for traffic.

Mr. Faber reported to the board that he had called the attention of Provost Marshal General Crowder to the waste of man power through the operation of jitneys. With jitneys twelve men are required to transport the same number of passengers whom two men on an electric car can transport seated.

Mr. Gadsden reported on conferences which he had had with Addis M. Whitney, of the Public Utility Conservation Division of the War Industries Board, in the interests of further coöperation. He also reported on correspondence with the Railroad Administration in regard to the suspension of operation of the Kenosha Electric Line. The stoppage in that city had been reported to the Railroad Administration by the mayor of Kenosha, but the War Board had pointed out to the administration that the fundamental cause was that the company had not received permission to increase its rates.

Mr. Faber reported conferences with the Fuel Administration on the subject of the skip stop and other fuel conservation matters.

The board is sending out a call for subscriptions to those companies which did not subscribe at the first call. It is hoped that there will be a prompt response.

The offices of the board on the ninth floor of the Munsey Building have been changed to other rooms better adapted to the purposes of the board, but on the same floor of the same building. The next meeting of the board is scheduled for Friday, July 12.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

New Jersey Strike Settled

Men and Company Agree to Abide by the Findings of the War Labor Board

The strike of motormen and conductors of the Public Service Railway, Newark, N. J., which for two days practically tied up the system of the company in northern New Jersey, was called off on the afternoon of June 7. The Federal Labor Board will arbitrate the differences between the men and the company.

The action of the men followed a report of their committee which earlier in the day had conferred with city, federal and company officials, at which it was suggested that their differences be submitted to the War Labor Board at Washington and that the men return to work at the wage scale offered by the company pending a settlement by the board.

The company, through President Thomas N. McCarter, agreed to stand by the board's award, and the men, through their decision, likewise agree to abide by the board's finding.

Representatives of the company and of the trainmen appeared on June 9 before former President William H. Taft of the National War Labor Board in Newark for the purpose of discussing the grievances of the men. B. L. Worden of the Submarine Boat Company, a member of the War Labor Board, and John J. S. Rogers, federal mediator for the Department of Labor, sat with former President Taft. Thomas N. McCarter, president of the Public Service Railway, with the vice-president and counsel of the company, spoke for the corporation.

Mr. Taft said that there were two ways by which the grievances might be heard. One was to submit the case to the full board, and the second was to submit it directly to the railway section. The latter method, he said, would save time. The employees were willing to take the short cut. President McCarter said that he would have to consult his board of directors before accepting either plan. The two sides were told that the board would sit at Washington on June 24.

The trainmen, in their complaint to the board, make these stipulations:

"A wage of 45 cents an hour, with 60 cents an hour for overtime, the question of pay for the men during the probationary period to be left to the Labor Board. Ten hours to be considered a day and the day's work to be finished during eleven consecutive hours. The start of the day to be reckoned from the time the men are ordered to report for work.

"A minimum wage of $20 a week for all extra men regularly answering roll-calls. No mandatory call to duty for men engaged on the cars after 10 p.m. until a twelve hours' rest period has elapsed."

Chicago Men Appeal to Washington

Employees of the Chicago Elevated Railways and the Chicago Surface Lines who recently were refused a wage increase of 15 cents an hour, have taken an appeal to the National War Labor Board at Washington. It is understood that the board has asked the companies whether they care to join in submitting the case to arbitration, but no announcement has been made as to their position on this point. Both companies are operating under agreements with the men, which do not expire until June, 1920.

Letting Down the Bars

The Interborough Rapid Transit Company and the New York Railways have raised the age limit of employees from forty-five to fifty-five years, in an effort to fill the gaps caused by the draft and the inducement of higher pay offered by the federal government and munition manufacturers. If this fails then women will be employed on the subway and elevated lines of the Interborough as ticket sellers and ticket choppers, and the men now filling these places will serve as guards. The selecting of younger men now serving as ticket sellers and choppers and fitting them for train service is now going on and their places are being filled with men of more advanced age.

The Detroit (Mich.) United Railway also has many positions for motorman or conductor open at the present time. That company has announced that it is ready to employ as conductors men as old as fifty-five or sixty years, providing they are alert, of good hearing and good eyesight. They must, of course, be able to speak English. In an announcement which it has just made the Detroit United Railway says:

"The position of conductor is one that a man of middle age can handle very nicely. The duties are comparatively light, in fact so much so that the work could be done by women.

"Many men from fifty to sixty years of age possibly consider that they are too old to apply for work on the street cars, that they would not be accepted because of their age. We wish to make it as plain as possible that this is a mistaken idea.

"Men of this age, as well as younger men, are desired."

Boston Men Ask Sixty Cents

Seek a Conference With Officers of Boston Elevated Over Question of Adequate Wages

The trainmen in the employ of the Boston (Mass.) Elevated Railway have asked for 60 cents an hour for blue uniformed men and for proportionate increases for employees in other branches of service. In a communication to Matthew C. Brush, president of the company, the men said in part:

"We have an agreement with your company which we intend to keep as far as it is humanly possible. Unfortunately, circumstances have arisen over which neither our members nor ourselves have any control. We neither want nor are threatening a strike. It is borne in upon us, however, every day that our members can no longer live upon the wage which they are now receiving, nor can they be kept at their present employment with the very attractive wages that are offered for less difficult, arduous and responsible work.

"A tremendous feeling of unrest is abroad among our people, with the result that unless something is done immediately, and of a very substantial character, you will not be able to keep these men in your employ.

"In view of the fact that the Legislature of the State has recently passed for your company a 'service at cost' plan, we do not believe that either the government or any other set of persons has a right to ask our men to make any greater sacrifices than they have already made.

"We therefore respectfully suggest under all the circumstances that the men engaged in transportation service should receive an increase to 60 cents an hour, and that the wages of all other employees who are members of our organization should be increased.

"We would like to have you arrange a conference so that we can deal with this emergency."

Subway Construction Work Stops

All work on the new subways stopped on June 10 when between 5000 and 6000 men engaged in all kinds of construction work on the new rapid transit lines in New York went on strike because they were unable to get the increased scale of wages which they demanded from the contractors, many of whom say they are on the verge of bankruptcy. Both James B. Walker, secretary of the Public Service Commission, and Matthew A. McConville, of the Allied Subway Workers' Union, laid the blame for the strike at the door of the Board of Estimate.

A Distinction with a Difference

There is no connection between the functions of the new Labor Policies Board and the National War Labor Board, of which William H. Taft and Frank P. Walsh are joint chairmen. The latter was created by an executive order of the President, and is in a sense the last court of appeal in labor disputes even when one of the parties in disagreement in some other branch or board of the federal government itself.

In all cases where the enunciated principles of the War Labor Board are involved it has authority to take jurisdiction. Its work is sometimes judicial and sometimes legislative, chiefly the former. It acts in effect as a legislative body when the enunciation of a new principle to govern industrial relations is in contemplation. Its findings are final and binding in all disputes between employers and employees where its principles of adjustments are in any way involved.

The Labor Policies Board will devote itself to administrative work. It will determine and develop policies for a unified labor administration. It will bring together and co-ordinate into one consistent policy the various and frequently inconsistent methods of important governmental departments in dealing with labor problems that affect production, always excepting disagreements between employers and employees, as the government departments represented on the Labor Policies Board are themselves among the large employers of labor.

Resolutions on Captain Bullock

Details of the death in France of Capt. Harry A. Bullock, formerly of the Brooklyn Rapid Transit System, have been received. Captain Bullock, who was an assistant divisional quartermaster, had conceived the idea of utilizing empty and thoroughly cleansed gasoline tanks for transporting drinking water to the men in the front line trenches. While working out the details of this plan with several American and French army officers four of the party, including Captain Bullock, were killed by a bomb dropped from a German aeroplane.

Resolutions of regret on Captain Bullock's death were adopted on June 10 by the Brooklyn Institution of Safety, of which he was secretary and executive manager from the time of its organization to that of his enlistment. These resolutions said, in part:

"Captain Bullock's engaging personality and unselfish devotion to the purpose for which the institution was formed endeared him to all who came into contact with him and we feel that his loss is that of a personal friend. He was patriotic to the core. Anticipating the present conflict, he prepared himself at Plattsburg before it came upon us, to serve his country if it should need his assistance, and when this occurred, he promptly abandoned his life work to enlist in defense of our liberties, a cause in which his experience and ability enabled him to render valuable service.

"In doing this he gave his life nobly and ungrudgingly. The people of this city, and particularly those of Brooklyn, will cherish and revere his memory, and his example will prove an inspiration to our youth who will emulate it and who will demonstrate that he did not die in vain."

Pacific Electric Raises Wages

Despite its difficult financial position, the Pacific Electric Railway, Los Angeles, Cal., as of June 1, has put into effect wage increases up to 43 per cent as compared with the wage scale of December, 1915. In making these increases the company has followed the recommendations of the National Railway Wage Commission as modified by Director-General McAdoo, whereby the largest percentage of increase goes to the lowest paid men. Thus men who received 25 cents an hour in December, 1915, are now getting 35½ cents.

In discussing this subject on June 4 at a meeting of the Pacific Club, Paul Shoup, president of the Pacific Electric Railway, said to 1500 of his men in humorous vein that "personally, I hardly know whether I would rather be a freight motorman or president of the company." Mr. Shoup said the railway would need $60,000 more a month in revenue to offset the increase in wages.

In discussing the question of the attempt to have Pacific Electric employees enter the Brotherhood of Railway Trainmen, Mr. Shoup declared his belief that during the war all matters affecting organization should be laid aside.

There is a belief in many quarters that the present attempt to unionize the Pacific Electric Railway is fostered by steam railroad men who have been displaced or demoted because of the government's elimination of duplicate service. These men prefer to stay in California rather than accept the government's offer to work East.

Short Strike in East St. Louis

Three hundred and seventy-five motormen and conductors of the East St. Louis & Suburban Railway, East St. Louis, Ill., struck for higher wages on June 4.

The conductors and motormen on the local lines of the company have been receiving 31 cents an hour, and the men on interurban runs 33 cents an hour, under an agreement into which the employees' union entered with the company on May 1, 1917, and which was to continue until May 1, 1919. They are now demanding 38 cents for city men, and 43 cents for interurban men, the increase to go into effect immediately. Before the agreement of May 1, 1917, was made the men were getting 27 and 28 cents an hour.

The day following the strike an agreement was reached under which the differences will be submitted to the National War Labor Board. The finding of the board is to be effective from June 1, 1918.

News Notes

Ohio Men Strike.—Thirty motormen and conductors on the Youngstown & Ohio River Railroad, Leetonia, Ohio, on June 6 struck for an increase of 5 cents an hour in wages. It is claimed they violated their contract in taking this step. They were receiving from 35 cents to 40 cents an hour, depending upon the length of time they had been in service.

Increase in Wages in Bloomington.—The Bloomington & Normal Railway & Light Company, Bloomington, Ill., has increased the wages of its employees approximately 3½ cents an hour. A nine-hour day has been placed into effect as far as possible. An arbitration clause has been placed in the contract which carried the increase. An open-shop policy will be maintained by the company.

Increase in Wages in Des Moines.—At the time that the fare increase was announced by the Des Moines (Iowa) City Railway, referred to elsewhere in this issue, Emil G. Schmidt, president of the company, also announced an increase in wages to the trainmen effective from June 1. The new scale is 30 cents an hour the first six months instead of 28 cents; 33 cents the second six months and 36 cents thereafter.

Labor Hearing in Washington on June 24—Press dispatches from Washington appearing in the daily papers on June 14 too late to be confirmed from official sources by this paper said that June 24 had been set by the War Labor Board for hearing in Washington wage controversies between electric railways and their employees, about a dozen of which are pending. The dispatches indicated that Messrs. Taft and Walsh will preside at the hearing and that from it a definite policy will probably be formulated to govern the relations between the men and the companies.

Bay State Men Accept Increase.—The trainmen in the employ of the Bay State Street Railway, Boston, Mass., have voted to accept the voluntary increase of 5 cents an hour granted to them by the management. The original demand was for an increase of 10 cents an hour over the existing maximum of 35½ cents an hour. In accepting the increase the members reserve the right to request higher wages as soon as the new board of control takes charge of the affairs of the company. The advance of 5 cents an hour brings the maximum of the Bay State carmen to 40½ cents a hour.

New Members of Engineering Foundation Board.—At the regular meeting of the trustees of United Engineering Society held on May 23, the following men were elected to the Engineering

Foundation Board: Calvert Townley of Westinghouse Electric & Manufacturing Company, New York, N. Y., succeeding Gano Dunn. The following are additional members: Silas H. Woodard, consulting engineer, M. Am. Soc. C. E.; Dr. Joseph W. Richards, professor of metallurgy, Lehigh University, South Bethlehem, Pa.; Dr. David S. Jacobus, advisory engineer, Babcock & Wilcox Company, New York; H. Hobart Porter of Sanderson & Porter, consulting engineers, New York.

Abortive Attempt at Strike.—About fifty employees of the Union Railway, one of the companies of the Third Avenue System, operating in the Borough of the Bronx, New York, went on strike on June 7, alleging that forty men had been discharged by the company for attempting to organize the men. The company regarded the matter as merely a disaffection involving a very small percentage of its employees. The men who went out, however, were prompt to take advantage of the present war labor situation to advance their own ends and appealed to the Department of Labor at Washington in the hope of obtaining some degree of recognition from the company. In this they were unsuccessful. Only recently an increase of 2 cents an hour as well as a bonus of $1 for first-year men working six days a week was authorized to become effective on July 1.

Federal Power to Regulate Rates.—In an opinion dated June 1, William L. Ransom, counsel Public Service Commission for the First District of New York, expresses the conviction that the national power exercised for the attainment of National objects in wartime emergency is paramount. He believes, however, that under the recent federal railroad act the Interstate Commerce Commission has no general power over interstate rates and that the regulation, review and revision of intrastate rate initiated by the Director General for ordinary intrastate commerce rest still with the state tribunals. If the rate provisions of the new law were to be upheld as a measure of taxation, the fixation of rates by the government would not be confined to those applicable to interstate commerce but could extend to intrastate transportation. Mr. Ransom, however, does not believe that Congress intended to delegate a taxing power in the form of a rate-fixing power.

Another Wage Increase in Camden.—The Public Service Railway has announced another increase for motormen and conductors employed on the Camden divisions. This is the second advance within a very short time. The new rates, which will prevail while the war conditions last, are 30 cents an hour for the first six months, covering period of learning; 35 cents an hour after first six months, and 40 cents an hour after five years. On June 1 of this year the company granted an increase of 2 cents to its conductors and motormen. Thomas N. McCarter, president of the company, announced that the company had decided to put into effect as of June 15 special rates of compensation to motormen and conductors, including women conductors. A minimum wage of $17.50 is assured every trainman who answers all rollcalls and performs such duties as may be assigned. To all persons entering the employ of the company for the first time an extra payment of $10 will be made upon completion of thirty days actual service. The Camden men were not involved in the recent strike.

Strike Threatens in Trenton.—The motormen and conductors in the employ of the Trenton & Mercer County Traction Corporation, Trenton, N. J., held a special meeting on June 10 and adopted a resolution demanding a flat rate of 40 cents an hour. The men also want time and a half for all overtime for all employees who do platform work. The company had previously offered the men a sliding scale to become effective July 1, calling for 30 cents an hour for conductors and motormen in the employ of the company six months; 35 cents an hour for those in the service four and one-half years, and 40 cents an hour for those employed five years and over. At the present time the wage scale is 31 cents an hour. The union has notified the company that unless the flat rate of 40 cents an hour is put into effect by June 14 the men will walk out. Rankin Johnson, president of the company, says that the flat rate of 40 cents an hour would mean an increase of $80,000 a year, and he does not see how the request can be granted. The company recently guaranteed a flat wage of $17.50 a week to "extra" trainmen, providing they make all the rollcalls.

New Common User Suits in San Francisco.—The United Railroads will enter suit against the city and county of San Francisco, Cal., for an amount aggregating several million dollars for damages that will ensue from the building of four tracks on Market Street. Suit for $865,250 damages already has been filed as compensation for the loss of value that the company says that it has sustained due to the construction of tracks on Market Street from Church Street to Van Ness Avenue. A claim has been filed with the Board of Supervisors for $288,500 damages the company says it suffered through the blanketing of its lower Market Street lines by the Municipal Railroad and by interference with its service caused by excavations made when the municipal tracks were installed. The new suit will be for damages due to depreciation of franchise value, loss by reason of interference with its service during the construction period and loss of revenue from the time the new line is operated until 1929, the date that the franchise expires. The contention of the United Railroads in all these suits is that the city has no right either to grant a franchise to another company or to build tracks and operate a competing line for more than five blocks on Market Street.

Franchise Relief Proposal Submitted.—A definite proposition has been made by the city of Seattle, Wash., to the Puget Sound Traction, Light & Power Company, stating terms under which the city might be willing to grant a suspension of certain franchise obligations during the period of the war. The city stipulates interchange of transfers with municipal lines, common user privilege on Third Avenue from Pine Street to Yesler Way; interchange of cars with the municipal railway in time of emergency; exchange of electric power up to 10,000 kw. in cases of emergency; and improved service on the city lines. The company has also been asked to increase its service by at least seventy cars. The company will consider the matter carefully and submit a definite proposition upon the return of President A. W. Leonard from Boston, where he has gone to confer with Stone & Webster, operators of the property. The Public Service Commission on May 22 dismissed the application of the company for an order relieving it of its franchise obligations, stating that the points of law involved had been decided favorable to the city's contention in the Tacoma 6-cent fare case, decided by the Supreme Court on April 27. The action before the commission was begun by the company on July 24, 1915.

Programs of Meetings

Central Electric Railway Association

The summer meeting of the Central Electric Railway Association will be held at The Breakers, Cedar Point, Ohio, on July 10 and 11.

Southwestern Electrical & Gas Association

At a meeting of the quarterly conference committee of the Southwestern Electric & Gas Association, held at the office of the Houston Lighting & Power Company, Houston, Tex., July 19 was selected for the first quarterly conference and Dallas was named as the city in which it was to be held.

It was determined to devote the morning of July 19 to separate meetings of the street and interurban railway, light and power and the gas sections under the chairmen, at which matters particularly pertaining to the business of each section will be discussed, the matters for discussion being outlined in an address by each one of the chairmen. The afternoon will be devoted to a joint meeting of all the sections to discuss matters generally affecting the three sections. These matters will be brought before the meeting in a report from the secretary. The principal subjects of this report are to be fuel, labor, increase of rates and fares and legislation, municipal, state and national.

All meetings will be executive meetings and no reports will be made of the meetings unless specially ordered by the association.

Financial and Corporate

Northern Electric Finance

Properties Transferred After Sale to Bondholders Organized as Northern Electric Railroad

On May 27 the California Railroad Commission announced that the corporation to be organized for the purpose of acquiring the Northern Electric Railway properties had the authority of the commission to issue $5,500,000 of bonds and $5,200,000 of stock. The authorization permitted the new corporation to proceed with the new reorganization plans for the several lines operating electric railroads between Sacramento and Chico, Sacramento and Colusa, Sacramento and Woodland, and also the branch line from Vacaville to Suisun. These companies include the following, which will be consolidated into a single owning company: Northern Electric Railway (main line), Sacramento to Chico via Marysville; Sacramento & Woodland Railroad, branch Sacramento to Woodland; Northern Electric Railway, Marysville and Colusa branch, Marysville to Colusa; Sacramento Terminal Company, belt line around Sacramento.

The Railroad Commission announces that the new corporation is to have an authorized stock issue of $5,200,000, divided into $1,902,200 of 6 per cent non-cumulative first preferred, $957,800 of 6 per cent non-cumulative second preferred and $2,340,000 of common. In addition, the new corporation is to have an authorized 5 per cent twenty-year bond issue of $5,500,000, divided into $2,012,400 of Class "A," $951,200 of Class "B," $1,268,200 of Class "C" and $1,268,200 of Class "D" bonds. The interest on Class "A" bonds is to be a fixed charge on and after July 1, 1917; on Class "B" bonds on and after July 1, 1919; on Class "C" on and after July 1, 1922, and on Class "D" on and after July 1, 1927. Because of the delay in putting the amended reorganization plan into effect, Class "A" bonds will bear interest from July 1, 1918. Interest on money paid in for Class "A" bonds prior to July 1, 1918, will be paid by interest checks. All classes of bonds are to be on an equal footing as to lien and security.

The commission concluded that reorganization expense should be amortized so as to be paid over a number of years and not become a permanent capital expenditure. The plan of reorganization to be followed up under the authority of the commission provides for a board of fifteen directors of which twelve will be selected by the bondholders and three by the stockholders.

On the day following this announcement by the commission the Northern Electric Railway was sold under foreclosure proceedings by United States Commissioner Francis Krull for $1,750,000, which was fixed by the United States District Court as a minimum upset price. The only bidders were the bondholders represented by attorneys for the reorganization committee.

In the course of a hearing before the Railroad Commission on this case, A. S. Kibbe, an expert for the reorganization committee, testified that during the incumbency of Receiver Coghlan, and up to March 3, 1918, $377,497 had been expended in new construction, extensions and improvements. He gave the operating revenue of the company in 1917 as $1,100,000. After deducting operating expenses and taxes, the net earnings for 1917 available for bond interest, etc., were $200,252.

P. E. Deficit Passes $6,000,000

According to the report of the Pacific Electric Railway, Los Angeles, Cal., for the calendar year 1917, just filed with the California Railroad Commission, the net deficit from operation, after some depreciation allowance, was $855,116. This brings the total deficit up to $6,170,453, or double the deficit of 1915.

The funded debt is $67,717,962, including a $9,000,000 long-term loan from the Southern Pacific Company. The company places the value of its road and equipment at $81,375,592 and its investments at $9,621,393.

The income statement for 1917 follows:

Operating revenue	$9,267,130
Operating expenses	6,257,982
Net operating revenue	$3,009,148
Non-operating income	65,730
Gross income	$3,074,879
Deductions:	
Rentals	$ 44,562
Taxes on railway operation	518,836
Interest on funded debt	2,830,787
Interest on unfunded debt	468,610
Miscellaneous deductions	97,200
Total deductions	$3,959,995
Deficit for year	$ 885,116
Debit balance on Dec. 31, 1916	5,122,430
Miscellaneous additions, 1917	151,714
Miscellaneous deductions, 1917	314,711
Deficit, Dec. 31, 1917	$6,170,543

Short-term Notes at 8 Per Cent

Both Bonbright & Company, Inc., New York, N. Y., and H. M. Byllesby & Company, Inc., Chicago, Ill., are offering a new issue of $200,000 of Ottumwa Railway & Light Company bond-secured 7 per cent gold notes dated June 1, 1918, due Dec. 1, 1920, at 97¾ to yield 8 per cent. The proceeds are to reimburse the company for outlays on additions and improvements. The notes are secured by deposit of 150 per cent of general mortgage 6 per cent bonds.

Providing for Shipbuilders

Shipping Board to Finance New $20,000 Oakland Electric Line—Railroad to Furnish Materials

The Emergency Transportation Company has been formed to construct and operate an electric railway in Oakland, Cal., connecting the plant of the Moore & Scott Iron Works shipbuilding plant with the San Francisco-Oakland Terminal Railways on Eighth Street, eight blocks away. W. R. Alberger, vice-president and general manager of the Key Route electric system, is president of the new corporation.

The new line will be a single-track one, for the use of the 6000 men employed in the shipyards. Under the plan agreed upon, the United States Shipping Board will furnish the funds and will control the line, while the materials will be furnished by the local electric railway. According to the application filed with the California Railroad Commission, the total cost of construction will be $20,000.

The City of Oakland has authorized the construction of the line and the commission has approved the scheme of financing. This provides for the issuance of 5 per cent promissory notes from time to time to the Shipping Board. These notes will become payable ninety days after the termination of the war. They will be secured by deposit of the company's stock.

The San Francisco-Oakland Terminal Railways will purchase at $100 (par) 101 shares of stock in the Emergency Transportation Company. This stock will be paid for chiefly in materials. For example, steel rails now valued at $100 a ton can be delivered under this agreement to the Emergency Transportation Company by the traction company for about $30 a ton.

American Power & Light Gross Rises 10 Per Cent

The gross earnings of the operating subsidiaries of the American Power & Light Company, New York, N. Y., for 1917 aggregated $11,389,659, as compared with $10,344,895 for 1916, an increase of $1,044,764 or 10 per cent. The net earnings at $4,762,414 represented an increase of $44,660, or a little less than 1 per cent. The small net, of course, reflected the heavy increase in operating costs and taxes. The gross earnings of the Pacific Power & Light Company, which supplies electric railway service to two communities and interurban service to three communities in Washington and Oregon, totaled $1,647,401 in 1917, as compared to $1,461,821 in the year preceding. Of the 1917 amount $155,966, or 9 per cent, represented railway earnings.

In the case of the Southwestern Power & Light Company, which furnishes electric railway service to one community in Texas, the railway earnings at $43,251 represented 1 per cent of the total gross, which increased from $4,193,265 in 1916 to $4,677,378 in 1917.

New York Bankers Balk at Utility Loans

Allege that Requirement for Bank Indorsement of These Loans is Unsound—Rate Need is Crux of Situation—Private Offering of Notes at 7¾ Per Cent

More than a dozen of the most prominent financiers in New York City at an informal conference at the Sub-Treasury on June 12 informed the War Finance Corporation that they do not purpose to lend their indorsement to the obligations of public utilities desiring loans from the War Finance Corporation until the earning power of such companies has been substantially increased. The bankers asserted that the provision of the act calling for virtual bank indorsements of loans is objectionable on the ground of unsound banking, for it calls on the banks to carry contingent liabilities which it is not proper for them to assume.

In brief, the bankers suggested that unless the war finance corporation act is amended the usefulness of the corporation will probably be limited to the making of direct advances to utilities as provided for in Section 9, which authorizes such direct loans "in exceptional cases." Another suggestion was that the public utility companies take steps to obtain permission to increase their rates so that their revenue may be increased and their credit standing bettered to the point where bankers will be more likely to undertake to finance them.

The Bankers Present

The meeting was called to learn the views of bankers on the subject of carrying out the provisions of the act relative to the indirect financing of war industries through banks. The bankers who attended the conference formed a most representative group. Those present were: J. P. Morgan; Francis L. Hine, president First National Bank; James N. Wallace, president Central Trust Company; Jerome J. Hanauer of Kuhn, Loeb & Company; Walter E. Frew, president Corn Exchange Bank; Gates W. McGarrah, president Mechanics & Metals National Bank; Charles E. Mitchell, president National City Company; Charles H. Sabin, president Guaranty Trust Company; Albert H. Wiggin, chairman Chase National Bank; Thomas W. Lamont of J. P. Morgan & Company; Frederick Strauss of J. & W. Seligman & Company, and Seward Prosser, president Bankers Trust Company.

The War Finance Corporation was represented by W. P. G. Harding, governor of the Federal Reserve Board and managing director of the corporation, and by other directors, including Clifford M. Leonard, Angus McLean and Eugene Meyer, Jr.

No Definite Conclusion Reached

At the conclusion of the meeting Mr. Harding gave out the following statement:

"A meeting of the board of directors of the War Finance Corporation has been held at the Sub-Treasury. A number of prominent bankers were present for the purpose of discussing the operations of the corporation in connection with the financial institutions of the country. The discussion of any specific cases was merely incidental to the discussion of the general principles involved. No definite conclusions were reached, and the board of directors of the corporation has no announcement to make at this time."

Mr. Harding stated that the meeting had not been called primarily to discuss the public utility situation, for which reason utility investment bankers had not been allowed a chance to participate in the discussion. He added, however, that the recent 7-per cent direct loan to the United Railways of St. Louis was really made to test what rate of interest would be proper for loans. In the case of the St. Louis company the character of the securities offered for collateral was excellent and the board realized that there would be no risk in making the six-months' loan. The collateral included $800,000 of Liberty Bonds.

Relative to proposals to amend the war finance corporation act, Mr. Harding said:

"No definite steps have been taken so far to amend the act. We thought it better to get more acquainted with the provisions of the act and learn the attitude of the bankers before making recommendations to Congress for any radical amendments."

Mr. Harding stated that the board still has under advisement the application of the Brooklyn Rapid Transit Company for a loan because of the maturity of $57,735,000 of notes on July 1. He added that the board has many applications before it, but that the volume has been reduced by the elimination of many which the board does not believe come within the terms of the act. It has been stated from other sources that applications numbering about 196 and aggregating $200,000,000 had been filed with the board.

Other Banks Are Considering Aid for Utilities

Since the announcement of the War Finance Corporation on May 28 that its resources are intended to be loaned directly to war industries only in exceptional cases and upon adequate security, bankers throughout the country have had put before them the question of providing financial aid for utilities. Meetings have been held in Boston, Philadelphia, Chicago and other cities.

One outgrowth of these meetings is a proposal to get all financial institutions of the country into an organization to finance the utilities and to secure for them such an increase in revenues as is necessary to stabilize their credit. While no definite plan has yet been outlined, such an organization might be along the lines of the memorable gold and cotton pools of 1914, when financial institutions acted in unity to supply gold to stabilize the exchange situation and to provide for the financial relief of Southern cotton growers.

Two other plans under discussion by banks are: (1) amendment of the war finance corporation act to provide, in unquestioned terms, for the relief of utilities, and (2) government control during the period of the war. There is a difference of opinion among bankers, it is said, as to the expediency of government control. One effect of such control, as illustrated in the case of the railroads, would undoubtedly be a sweeping increase in rates commensurate with the increased cost of operation. The crux of the public-utility problem is the rate situation. With a proper rate structure, the credit basis of utilities would be such that they could dispose of new securities to take care of maturing obligations.

Warburg Emphisizes Need

The pressing need of utilities was emphasized by another man of national importance when Paul M. Warburg, vice-governor Federal Reserve Board, spoke before the National Conference on War Economy in New York on June 6 as follows:

"The drastic shrinkage in the value of public utility investments and the impairment of the credit of these corporations is a source of grave danger to the general financial situation at this time. It would be a serious menace to the ability of the government to finance the war if public service corporations should be forced to go into receivers' hands because of conditions for which they are not responsible.

"The President, in his letter to Secretary McAdoo on Feb. 19, 1918, expressed his profound concern over the situation, stating at the same time that he hoped state and municipal administrations would make every effort to deal with these corporations in a spirit of liberality.

"All that it is proper for me to do, therefore, is to emphasize the public interest in the protection of the credit of these corporations and in the preservation of their ability to perform their important functions.

"It is gratifying to note that a number of leading municipalties, after a careful study of this problem, have since decided to make such equitable adjustments as to enable their public service companies to weather the storm. It is hoped that their example will be emulated throughout the entire country."

Seattle Offerings at 7¾ Per Cent

An offering by private bankers which is of especial interest at this time is announced by Harris, Forbes & Company for a large group of representative dealers and bankers in the case of the Puget Sound Traction, Light &

Power Company, Seattle, Wash. For the purpose of providing funds for the retirement at par and interest on Aug. 1, 1918, of its 6 per cent bonds maturing on Feb. 1, 1919, and covering the cost of additions recently made to the property, this company has authorized a new issue of $12,250,000 of 7 per cent mortgage gold notes due on June 1, 1921.

These notes are secured by a first mortgage on part, and a direct mortgage on most of the balance of the property, subject to various underlying bonds, no more of which can be issued. They are followed by more than $34,900,000 of preferred and common stocks, and additional notes can be issued for only 75 per cent of the cost of construction and improvements, if net earnings are at least one and three-fourth times the interest charges on all bonds and notes outstanding and proposed. Provision is made for an annual sinking fund, which with the sinking funds on underlying bonds will amount to at least $560,000 each year in 1919 and 1920.

The issue is being offered at 98 and interest to yield 7¾ per cent. The company agrees to pay any normal federal income tax to an amount not exceeding 2 per cent. The notes are in coupon form, registerable as to principal, and of $500 and $1000 denominations. They are callable in whole or in part, upon thirty days' notice, at 102 in 1918, 101 in 1919 and 100 in 1920.

War Business Helps Long Island

A large additional passenger business during the calendar year 1917 was created by the location of army camps along the lines of the Long Island Railroad, New York, N. Y. The total number of soldiers handled was 751,215, requiring 1557 train movements, to say nothing of the traffic of visitors to and from the camps. The total operating revenues at $17,286,178 represented an increase of $2,314,340 or 15.56 per cent over 1916. The number of passengers increased 4,993,306 or 10.90 per cent. The commutation travel showed an increase of 7.3 per cent notwithstanding a small loss on the North Shore and Atlantic divisions, where certain extensions of the city rapid transit system have drawn traffic from the company's lines.

The operating expenses for 1917 totaled $11,960,534, an increase of $2,033,327 or 20.4 per cent. The increase was due to the increased cost of labor and materials, and the increased service to army camps. The taxes amounted to $944,293, an increase of $65,246 or 7.42 per cent. After the deduction of interest, the result for the year was a surplus of $869,300. This was an increase of $627,829 for the last year.

Upon the army cantonment at Yaphank the company expended $219,063 for facilities within the camp, besides about $60,000 at other points for passing tracks, telephone and signal systems and the like.

Electric Railway Relief Urged

Mr. Gadsden Tells the Ways and Means Committee of the House of Representatives That In Six Months the Net Income of the Railway Industry Will Vanish

That the financial condition of electric railways is such as to warrant their being placed in a segregated class under any new revenue legislation was the opinion expressed on June 11 by P. H. Gadsden, resident Washington member Electric Railway War 'Board, before the committee on ways and means of the House of Representatives. Mr. Gadsden averred that within six months the net income of the industry will reach the vanishing point unless relief comes.

Net Income Loss 59 Per Cent

Two phases of the utility situation, the speaker said, must constantly be borne in mind: The decrease in net revenue, and the necessity of financing maturing obligations. Without adequate revenue the refinancing cannot be accomplished. Mr. Gadsden presented the accompanying income statement of 103 electric railways for the three months ended Mar. 31, 1918, as compared with the similar period in 1917. This shows a gain of 2.1 per cent in operating revenues, but a loss of 59.7 per cent in net income. The data were secured by the Electric Railway War Board.

INCOME STATEMENT OF 103 ELECTRIC RAILWAYS FOR THREE MONTHS ENDED MARCH 31, 1917 AND 1918

	1918	1917	Increase Amount	Increase Per cent
Total operating revenues	$61,734,670	$60,456,333	$1,278,337	2 1
Total operating expenses	43,799,663	39,691,302	4,180,361	10.6
Net operating revenue	$17,935,007	$20,837,031	*$2,902,024	*13 9
Net revenue from auxiliary operations	$ 2,508,086	$ 2,271,199	$ 236,887	10 4
Taxes	4,637,648	4,267,641	370,007	8.7
Nonoperating income	1,136,499	956,071	180,428	18.9
Gross income	$16,941,947	$19,796,660	*$2,854,713	*14 4
Deductions from gross income	14,713,512	14,269,320	444,192	3.1
Net income	$ 2,228,435	$5,527,340	*$3,298,905	*59 7

*Decrease

The relief which the revenue authorities can grant Mr. Gadsden asserted, is to put electric railways and other utilities in a segregated class on the basis of reduced taxation. The point made was that it would not be so wise to impose a 6 per cent or larger income tax as it would to leave the little remaining net income in the hands of the companies in order to keep the breath of solvency in them and help provide the additional facilities now demanded. The electric railways have shown the worst revenue decreases of all utility groups and are on the brink of bankruptcy. Relief from the present excessive taxation burdens would show the sympathy of Congress and would help the companies to secure adequate rates.

The Financing Problem

In regard to the second fundamental point in the present situation, Mr. Gadsden said that utility representatives had been disappointed in the recent direct-loan rulings of the War Finance Corporation, for they had hoped that the public utilities would have the same rights before the corporation as the steam railroads. But relief must be sought in the first instance through banking channels. Utilities are now trying to work out their salvation in this way.

Representative Rainey raised the question of a moratorium for maturing indebtedness, but Mr. Gadsden expressed his views on this subject as follows:

"We have given this, naturally, the most serious consideration. A general moratorium for all securities in the market is one thing, but a special moratorium would involve discrimination and cause people to think that public utility securities are worthless. To our mind that would mean death, not only now but hereafter. It would permanently impress upon the securities of public utilities the fact that when a great crisis of national emergency arose they broke down."

Should the Nation Take Over the Utilities?

When asked whether the situation would not be better if the electric railways had been included under the federal steam railroad act, Mr. Gadsden said:

"We are very much inclined to think so now. We made no effort to be included at that time. We believed that we could get our rates increased and work out our own salvation, and that it was better to try to help ourselves than to lie down. The situation is getting worse, and the most effective way to meet it would be for the government to take us over. Of course, there are a great many companies not in need of any such assistance. The electric railway industry undoubtedly is.

"There will have to be some drastic treatment, but as to whether or not the situation should be presented to the Director of Railroads of the committee on interstate and foreign commerce, which could frame an amendment

placing electric railway properties within the purview of the railroad legislation, we doubt the propriety of our making such representations. It is well enough for us to discuss this subject before a committee, but we question whether the other plan would put us in the proper light before the people of the country. We are attacking each phase of the problem as it comes up. Each committee has a problem for consideration, and we are appearing before some committee or tribunal and spending our days and months trying to bring this problem home to the people of the United States, because it has got to be handled in a serious, statesmanlike way. Otherwise this great industry is going by the board."

Financial News Notes

Hearing on June 20 on Abandonment.—Acting on the petition of the Cincinnati, Milford & Loveland Traction Company, Cincinnati, Ohio, for permission to abandon its road, the Ohio Utilities Commission has announced that it will hold a hearing on the petition in Cincinnati on June 20.

Business Men May Save Line.—To prevent the junking of the Consolidated Street Railway, which connects Cottonwood Falls and Strong City, Kan., business men of Cottonwood Falls are considering a plan to buy the line. The company recently asked permission of the Public Utilities Commission to discontinue the line.

Another Offer of Sale Made.—The Board of Control of London, Ont., on May 23 received from George B. Wood, Toronto, president of the London & Lake Erie Traction Company, an offer to sell to the city for $300,000 the line from London to the top of the hill in the city of St. Thomas, together with two-thirds of the rolling stock. The company had previously asked $450,000 for the whole road to Port Stanley. A summary of the valuation and report by Sir Adam Beck, chairman of the Hydroelectric Power Commission of Ontario, to the City Council was published in the ELECTRIC RAILWAY JOURNAL of May 25, page 1021.

May Ask for Railway Merger at Dayton.—There are rumors that the special committee appointed to investigate the electric railway situation at Dayton, Ohio, will recommend the amalgamation of the six railways as a means of improving transportation facilities. The roads operating in Dayton are the City Railway, the Peoples' Railway, the Oakwood Street Railway, the Dayton Street Railway, the Ohio Electric Railway and the Dayton, Springfield & Xenia Railway. The committee consists of J. F. Ohmer, representing the manufacturers; J. L. McKitrick, of the Central Labor Union, and Frank Wright, representing the business interests generally.

$2,151,000 of Refunding Bonds Authorized.—Permission has been granted by the Public Service Commission of the Second District of New York to the Albany Southern Railroad, Hudson, N. Y., to issue $2,151,000 of first refunding mortgage thirty-year 6 per cent bonds. Of the bonds $1,451,000 are to be used to exchange a like amount of first mortgage thirty-year 5 per cent bonds now outstanding. The company also is empowered to pledge $700,000 of 6 per cent bonds as security for $550,000 of three-year notes, which are to be sold at not less than 96 and the proceeds used to reimburse the treasury, to discharge floating liabilities outstanding on June 30 last and to pay for proposed new construction work amounting to $190,683.

New Stock Issue for Des Moines.—Shareholders of the Des Moines (Iowa) City Railway have voted to amend the articles of incorporation so that the authorized capital stock, now consisting of $3,000,000 of common and $250,000 of 6 per cent non-cumulative preferred (all the preferred and $1,055,000 of common being outstanding), shall be increased to $4,500,000, to include $3,000,000 of common as at present; $1,500,000 of 7 per cent preferred stock in $100 shares. These new preferred shares will be cumulative from May 1, 1918, with preference also as to assets in case of liquidation and will carry the same voting powers as the common. They will be callable, all or any part, on any dividend date at 107½ and dividends, at the option of the company.

Twin City Common Dividend Passed.—The directors of the Twin City Rapid Transit Company, Minneapolis, Minn., on June 3 passed the dividend on the common stock for the second quarter of 1918. The company had paid 6 per cent on the common stock from 1909 to 1918. At the former quarterly meeting the dividend was reduced and the payment for the first quarter made at the rate of 1 per cent for the period, or 4 per cent annually. Horace Lowry, president of the company, issued a brief statement to the effect that in consequence of the continued decrease in the company's earnings, the steadily increased cost of operation and greatly lessened net returns, the company finds it impossible to continue paying dividends on its common stock.

Kewanee Deficit Increases.—The total operating revenues of the Galesburg & Kewanee Electric Railway, Kewanee, Ill., for the fiscal year ended April 30, 1918, amounting to $82,142, show an increase of $4,466 or 5.8 per cent compared with those of the preceding year. City revenue increased $3,782 or 9.4 per cent, and interurban revenue $701 or 1.9 per cent. The operating expenses at $71,960 increased $9,406 or 15.0 per cent, more than offsetting the increase in revenue. In connection with higher interest charges the increased expense resulted in a deficit of $16,358, as compared with a deficit of $10,551 for the preceding year. Application to the Illinois Public Utilities Commission for authority to charge higher rates of fare was made on July 31, 1917, but although the commission held two hearings on the matter in November, no decision has yet been rendered.

Merger Offers a Way Out.—Richard Sachse, chief engineer of the California State Railroad Commission, recommended the consolidation of the transbay interurban system on May 24 when he took the witness stand to make a statement on the consolidation scheme worked out by the commission's engineers in the transbay ferry rate case which was on trial before the commission. In reviewing the transbay transportation situation Mr. Sachse stated that he believed that if the San Francisco-Oakland Terminal Railways and Southern Pacific Company did not favor the consolidation plan the commission could recommend it to the railroad administration as the best solution of the transbay transportation problem. In determining the rates Mr. Sachse recommended that the commission adopt as the rate base the valuation for the lines necessary to serve the territory, which his department has fixed at $22,065,000 as a fair basis for computing the rates.

Electric Railway Monthly Earnings

AURORA, ELGIN & CHICAGO RAILROAD, AURORA, ILL.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$168,693	*$138,511	$30,182	$36,093	†$5,911
1m., Mar., '17	163,197	*123,232	39,965	36,036	3,929
3m., Mar., '18	439,408	*410,158	29,250	107,399	†78,149
3m., Mar., '17	469,516	*352,564	116,952	107,447	9,505

NEW YORK (N. Y.) RAILWAYS

1m., Apr., '18	$983,452	*$751,509	$231,943	$284,487	‡$15,393
1m., Apr., '17	1,033,608	*784,799	248,809	283,808	‡12,740
10m., Apr., '18	9,967,978	*7,649,583	2,318,395	2,832,702	‡9,055
10m., Apr., '17	9,389,814	*7,547,977	1,841,837	2,820,195	‡451,531

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
12m., Apr., '18	$6,610,538	$4,230,471	$2,380,117	$1,021,657	$1,358,460
12m., Apr., '17	5,672,188	3,168,587	2,508,601	928,034	1,580,567

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1 m., Apr., '18	$218,862	*$134,603	$84,259	$40,490	$43,769
1 m., Apr., '17	201,591	* 130,576	71,015	40,714	30,301
12m., Apr., '18	2,488,835	*1,604,642	884,193	489,375	394,818
12 m., Apr., '17	2,423,840	*1,511,622	912,218	501,198	411,020

* Includes taxes. † Deficit. ‡ Includes non-operating income.

Traffic and Transportation

Commission Sees Fare Need

It Cannot Act, However, on Account of Court Decisions—City Line in Serious Straits

The Public Service Commission for the Second District of New York has sent to patrons of the Buffalo & Lake Erie Traction Company a review of conditions revealed in the investigation of the petition of George Bullock, as receiver of the company, for permission to increase the rate of fare.

Commissioner Barhite conducted several hearings, and then followed the decision of the Court of Appeals holding that the Public Service Commission has no jurisdiction to determine rates where such rates are fixed by franchises granted by a city, town or village. The road is restricted by franchise rates in some of the cities, villages and townships through which the line passes. Thus the decision of the Court of Appeals takes away from the Public Service Commission jurisdiction to increase or decrease the fare in all of the places where the railroad has entered into an agreement not to charge more than a certain amount. On portions of the road where there is no such agreement the commission still has jurisdiction.

Why the Commission Can't Act

Under the conditions it is obviously impossible for the commission to make a rate which will be equitable as between patrons of different portions of the road. If the commission finds that the condition of the finances of the road are such that a raise in rates as asked will be necessary and is favored by the commission, it is impossible to make a just and fair rate or one which will not be discriminatory.

Steps taken by the receiver to abandon certain parts of the road were followed by a request that the commission make a report stating the condition of the road's finances and for such facts and figures as might be necessary for a determination whether or not the road is entitled to an increased fare.

The commission says in part:

"An examination of the annual reports of the road for several years past shows that the income of the road has not been sufficient to pay expenses of operation. From July 1, 1912, to June 30, 1912, the net deficit was $257,037; July 1, 1913, to June 30, 1914, the net deficit was $269,802; July 1, 1914, to June 30, 1915, the net deficit was $278,613; July 1, 1915, to June 30, 1916, the net deficit was $178,767; Jan. 1, 1917, to Dec. 31, 1917 the net deficit was $153,014.

"The receiver in his application for an increase of rates does not ask for anything with which to pay dividends. If the railroad is able financially to pay dividends it should not be in the hands of a receiver. The receiver has expressed himself as willing to use any excess in fare over the present rate solely for the payment of such interest as must be paid on bonds and receiver's certificates and to better the equipment and service of the road. The employees of the road are demanding more pay and are very patiently awaiting the outcome of the proceedings.

Dunkirk Line in Serious Shape

"In the opinion of the commission the receiver must have more income if he is to continue to operate the road and give proper service. The commission is also of the opinion that the only source from which additional revenue may be had is from increased rates. In view of the limitations upon its power made by the Court of Appeals the commission cannot make the decision to which it thinks the receiver is entitled. That can be done only in case the various cities, villages, and townships shall remove the restrictions as to rate of fare in the franchise granted by them. Whether the restrictions are to be removed rests solely with the local authorities. The Public Service Commission has no authority over this matter and expresses no opinion as to the proper course to be taken.

"With regard to the Dunkirk Street Railway the figures show that the road is operated at a great loss. The net loss from the figures available appear to be at least $25,000 a year. It is a serious question whether the receiver should not be permitted to abandon the road.

"This opinion has no legal effect and is given solely at the request of the patrons of the road to be used by them in forming their judgment as to what shall be done."

Cut-Rate Tickets Eliminated

Partial emergency relief has already been granted the Aurora, Elgin & Chicago Railroad, Wheaton, Ill., through the efforts of the city officials and local chambers of commerce of Aurora and Elgin, who made a trip to Springfield, Ill., and entreated the commission in behalf of the railway. The commission was so impressed with this unusual procedure that without waiting to take action on the application of the company for increased fares, it issued an order for the withdrawal of six-for-a-quarter tickets in Aurora, and of six-for-a-quarter and seven-for-a-quarter tickets in Elgin, effective on June 10. A straight 5-cent fare is now in effect in these cities. A hearing on the application of the railway for increased fares will be held before the commission during the week ending June 22.

Cleveland Fears Fare Raise

City Greatly Concerned Over Failure of Model Franchise to Work Successfully in War Time

Mayor Harry L. Davis has advised the City Council of Cleveland, Ohio, to confer with the Cleveland Railway in an effort to secure its consent to one or more of four propositions which he has formulated to prevent an increase in the rate of fare as a result of the expected increase in the wages of motormen and conductors. Mayor Davis argued that something should be done to obviate the necessity of amending the Tayler franchise, if a material wage increase is granted, as the maximum rate of fare provided for the franchise will not cover the additional amount required for operating expenses. The Mayor's proposals follow:

Outline of Mayor's Proposal

Agree to a stock dividend reduction from 6 per cent, as guaranteed by the Tayler franchise, to 4 per cent.

Co-operate with the city in securing federal action to regulate opening and closing hours of factories and stores in order to distribute the rush-hour congestion over a longer period.

Restrict extensions and improvements and make every effort to have the present equipment suffice during the war.

Postpone for the period of the war charging off suspense accounts—deficits in maintenance and operating accounts now payable to the company at the rate of $100,000 per month.

Mayor Davis argues that conditions are unusual at the present time and that the public should not be asked to stand the entire weight thrown upon the road by the increase in expenses brought about by the war.

J. J. Stanley, president of the Cleveland Railway, presented a letter to the City Council on the evening of June 10, in which he refused to accede to Mayor Harry L. Davis' request that the dividends be reduced during the war period in order that the rate of fare may not be increased. He said that the rate of return on the investment was so low that he could not ask stockholders to consent to a reduction.

Mr. Stanley in Partial Agreement

Neither was he willing to waive payments on the suspense accounts accumulated from the deficits of other years. The other two suggestions made by the Mayor were acceptable. They were that hours for closing stores and factories be regulated in such a way as to distribute the rush-hour load and that improvements be restricted to absolute necessities during the war.

It is said that the Mayor will reply to the letter and urge that his suggestions be accepted for the period of the war. President Stanley said in his letter that the guarantee by the city of a return of 6 per cent on the investment was the only thing that made this possible. It would not be right now to reduce it.

Experience of Others Helpful

Dallas Officials Tour Cities of the Middle West in Quest of Operating Kinks Applicable in Texas City

Much information that will be valuable in assisting in the solution of the traction problems of Dallas, Tex., was gathered by M. N. Baker, Supervisor of Public Utilities of that city, and Richard Meriwether, general manager of the Dallas Railway, who have returned from a tour of a number of cities of the Middle West that have electric railway systems of recognized efficiency. Questions particularly studied by Messrs. Baker and Meriwether related to elimination of belt lines and the installation of a radial system of car lines, safety zones and traffic regulations in general that may be made to apply to conditions in Dallas.

The information gathered will be placed before John A. Beeler, traffic expert, who is now making a survey of traffic conditions in Dallas with a view to recommending changes that will solve the many perplexing transportation problems and give the maximum of service at a minimum of cost.

On his return to Dallas Mr. Baker made a statement in part as follows:

"While the cities we visited exhibited a marked variance in the standards of efficiency maintained by their railway systems, we were able in nearly every instance to trace these variations to one cause, namely, the presence or the absence, as the case might be, of a spirit of co-operation between the municipality and the utility. We find that it has been the experience of these cities that where the relation between the city and the traction company has been one of co-operation and mutual support, the best results have always been obtained in the upbuilding of both the city and the street railway system, while on the other hand a spirit of antagonism and strife between the two (which was noticeable in two of the cities we visited) has invariably resulted in retarding the progress of both.

KANSAS CITY AN ACE

"This is strikingly illustrated at Kansas City, where, through a policy of close co-operation, that city has built up one of the best railways in the entire country. Municipal participation in the earnings of the company, through 'partnership franchise,' has everywhere been a notable factor in the promotion of this co-operative spirit, which has contributed so much to the high state of development and efficiency of the railway services in Kansas City, Chicago and Cleveland.

"Among the interesting features of the street railway systems we investigated are the following:

"*Safety Zones.*—It is a universal practice in Northern cities to set aside certain spaces near the downtown street intersections known as safety zones, where the loading and unloading of cars can be accomplished with safety and dispatch, free from any interference by vehicular traffic. These zones are marked by conspicuous upright iron signs, placed near the tracks and connected by iron chains.

"*Skip Stops.*—The skip-stop system is rapidly being adopted throughout the country, at the request of the government as a fuel conservation measure. It benefits the public by speeding up the running time of cars; it reduces the service cost to the utility, and it contributes directly to the cause of winning the war by the enormous saving in fuel which it accomplishes, it being estimated that each stop eliminated means an equivalent saving of three-fourths of a pound of coal.

"*Employment of Traffic Specialists.*—The employment of a traffic engineer to help solve the traffic problems in Dallas is fully in line with the latest practices of other cities, and is vindicated by the results they have obtained, especially in the cities of Washington, Kansas City, Cleveland, Milwaukee, Chicago and Toledo.

MILWAUKEE POINTS THE WAY

"*Milwaukee's Profit-Sharing Plan.*—One of the most interesting features of railway organization that came under our observation—a new departure of much significance as showing the trend of the times—was the profit-sharing plan operated by the Milwaukee Electric Railway & Light Company. The company first established a table of normal operating expense per car-mile and the normal operating revenue per car-mile. Then, as an inducement to the trainmen to develop themselves as 'salesmen of service,' the company voluntarily agreed to pay them a bonus of 25 per cent of all profits received by the company over and above these fixed standards of expense and revenue. The trainmen have organized an employees' savings and loan association, into which they deposit their savings derived from their share of the company's profits, and they have been able to save many thousands of dollars in this way. The result has been to improve the service to the public, increase the schedule speed of the cars, and to make both the company and the employees more prosperous and also more interested in each other's welfare.

GOOD PUBLIC RELATIONS ESSENTIAL

"As a result of my observations in the North, I am more than ever convinced that the success and efficiency of any traction system is ultimately determined by the character of the relations existing between the utility and the city, their mutual regard for each other's interests, and their willingness to co-operate each with the other. The people of Dallas now have a proprietary interest in the local traction system under the new franchise, and there is no reason or incentive lacking for making our transportation system the best there is in the country, through a policy of proper supervision, liberal co-operation and unstinted support."

The knowledge of some of these innovations, gained at first hand in the cities visited by Messrs. Baker and Meriwether, is expected to prove an invaluable aid in helping the local Dallas management put into effect with a minimum of opposition such changes as may be decided upon as advantageous for adoption in that city.

Newspaper Fare Referendum

The Railroad Commission of Wisconsin, in its fare order of June 1, 1918, evidently intended that the city lines of the Milwaukee Electric Railway & Light Company should not continue making up losses on the nine suburban lines. The city lines are by that order, reviewed in the ELECTRIC RAILWAY JOURNAL for June 8, limited to a bare 7½ per cent interest return on their value as fixed by the commission.

The suburban lines are operating at a heavy and steadily increasing loss. For the year ended March 31, 1918, this loss was as follows:

7½ per cent interest on investment	$118,500
Operating expenses over gross revenue	12,950
Total loss for twelve months	$131,450

The company says that with the higher wage scale effective on May 1, 1918, the loss for the next twelve months will be $25,000 more, or $156,450, unless fares are raised or service heavily cut—or abandoned—to reduce expenses.

In order to learn what the railway patrons of Milwaukee city and suburbs think ought to be done in this matter the company has decided to conduct a referendum and is asking its patrons through paid ads in the newspapers to cross out one of the two propositions below which they do not indorse, and send the clipping on the back of a post card or inclosed in an envelope to the commission.

1.—We believe Milwaukee's city car lines should be allowed to earn enough to make up losses on suburban lines.

2.—We believe fares on Milwaukee's suburban car lines should be high enough to pay the whole cost of operating these lines, including a 7½ per cent rate of interest on their value fixed by the commission.

Six Cents Now in St. Louis

The 6-cent fare was put into effect on June 1 on the lines of the United Railways, St. Louis, Mo. The advance from 5 cents was made in accordance with the decision rendered by the Public Service Commission of Missouri, to which reference has been made at length previously in the ELECTRIC RAILWAY JOURNAL. Other cities, towns and villages have gone over to a 6-cent fare, but they have not measured up to St. Louis in size. There about 1,000,000 people changed their habits over night, for paying 5 cents on the cars is often all more or less of a habit.

There was some confusion, but con-

sidering the magnitude of the change things went pretty well. The cars carried placards warning everybody to get ready for the change. The women were especially forgetful. Some of them were even so far out of touch with the times that they wanted the whole thing explained to them. There were many funny incidents, some grotesque and a few bordering on the serious. It was a field day for the newspaper humorists and cartoonists, and the history of the change is writ large in the local papers. The company fortified itself in advance with eleven tons of pennies for making change.

On June 2, Bruce Cameron, superintendent of transportation of the company, said:

"We were very much surprised at the smoothness with which the new system was introduced. Most of the passengers had the correct change. When they did not have it, we supplied it. Everybody was cheerful and paid the increased fare without murmuring, except a few, who remonstrated, but paid it anyway. A good many used tickets, and we anticipate that the use of tickets will greatly increase. We had a little trouble with the boxes choking up, due to the conductors failing to empty them often enough, but we do not think that will occur again. There was no delay in the operation of the cars."

St. Louis County residents continued to ride for a nickel, because the increase allowed by the commission does not extend to the county lines, but an extra fare inside the limits costs the regulation 6 cents.

Columbus Would Charge Five Cents

The Columbus Railway, Power & Light Company, Columbus, Ohio, made formal application to the City Council on June 3 for an increase in the rate of fare from eight tickets for a quarter to straight 5 cents, with free transfers, as in the past. In return the company agrees to raise the wages of employees and make such extensions and improvements as are warranted by the decisions of the War Finance Corporation, when application is made for the loan of funds for such purposes.

The motormen and conductors are now receiving from 24 to 31 cents an hour, according to the length of time they have been in the company's service, and it is proposed to make an increase of 6 cents an hour. This would bring the schedule up to a basis of 30 cents to 37 cents an hour. The communication to the Council indicates that the men should have more money for their work and states that many of them have gone to other industries.

Application had already been made to the War Finance Corporation for a loan, but since that time conditions have been made that renders it uncertain as to what amount can be secured, if any.

Following the presentation of this communication Councilman Nailor introduced a resolution providing for a hearing on the matter.

Transfer Charge Refused in New York

Commission Rules That Under Law It Could Grant Only Fragmentary Relief—Advises Companies to Seek Municipal Aid

The Public Service Commission for the First District of New York on June 6 announced that the several electric railways in New York City which a year ago applied for permission to charge 2 cents for transfers should apply to the municipal authorities for changes in their franchise grants. The opinion states that under the recent Rochester decision of the Court of Appeals the commission cannot legally grant a transfer charge on any other than a fragmentary basis and that under the circumstances the results would probably be disastrous to the companies.

The decision was rendered in the case of the Third Avenue Railway, but according to the commission's remarks it is in part plainly applicable to the cases of the New York Railways and the Brooklyn Rapid Transit Company. The commission feels that the revenue needs of the companies should be carefully examined, but it commends the whole matter of the most advisable procedure for relief to the consideration of the companies and the municipal authorities. For the present the hearings in the several cases are held subject to call, until the companies announce their future course.

Partial Transfer Charge is No Relief

The commission's finding follows in part:

"It is evident that the law of the proceeding, as now confirmed and clarified by the Rochester decision, leaves the commission with only a fractional and fragmentary power to deal with the revenue situation of this system through the expedient of a charge for transfers. At a multitude of the most pivotal points where passengers transfer, the commission could not, if it would, in the absence of municipal consent, empower the company to do otherwise than accord a transfer privilege without additional charge. At some points—a number of them important points—the commission would evidently be in position to make a 2-cent charge for transfers effective, in its discretion, upon an adequate showing of facts and probable operating consequences.

"The result, if the commission were to exercise its full discretion and permit a charge for transfers wherever legally possible, would be a disjointed and confusing situation—free transfers given at many points, 2 cents demanded at many others, with always the possibility that payment would be exacted or attempted at many points where none should be, and with the traveling public never certain whether at a given point it had a right to a transfer without additional payment.

"Surface railroad traffic would be diverted from its normal and most direct routes to longer hauls over routes for which transfers could be had without payment, and a large degree of confusion to the public and loss to the companies would be the almost inevitable result. Granted that the establishment of a universal charge of 2 cents for transfers would serve in large measure to solve the acute financial situation of which the Third Avenue System now complains, it is by no means sure that there would be favorable financial results from the hit-and-miss promulgation of such a charge.

"It does not seem that there is any way of dealing with this fare, transfer and revenue situation on the Third Avenue surface lines, without the consent and co-operative action of the municipal authorities, which would not have the effect of driving away traffic and decreasing revenues. The surface lines of this and the other systems of the city are destined to face increasing difficulties in holding their business and commanding their share of the traffic; the installation of such a piecemeal charge as the existent legal limitations leave within the commission's power would bring disaster.

Must Deal With the City

"By these companies' own choice, the local municipality has both a power and a responsibility, and no resort to a fragmentary plan of charging for transfers should avail to enable these companies now to avoid dealing with the municipality as to the terms and conditions on which a modification as to fares will be permitted. The city may be unqualifiedly willing that an increased fare on all surface and rapid transit lines shall be temporarily charged; it may be willing to consent to such an increase in return for terms and concessions of present or future public advantage, or it may not be willing to release the companies from their contract obligations at all. The matter of terms rests with the municipality, because the companies wanted the franchise so much that they bargained on the subject of fares and agreed to be ever bound by a 5-cent limitation, at the city's option. When the franchise limitations no longer stand in the way, the companies may come to the commission for the fixation of a reasonable and adequate rate, notwithstanding statutory barriers.

"The petitioners and any other transportation companies which feel now the 'pinch' of rising costs, ought to consider whether, instead of coming forward at this time with an application for a radical and lasting readjustment in existing transfer systems and bases of fares, they ought not to confine themselves to frank, direct requests for emergency relief, carefully limited to the duration of the war.

"If transportation service is to be continued on any efficient or endurable basis, during the war and afterwards, the proper public authorities must squarely face and act upon their responsibility for conserving the corpor-

ate income of essential utilities, even through the granting, where necessary, of proper applications for emergency relief during the war period.

"An application for a temporary increase in rates for the purpose only of eliminating present deficits in operating revenue and restoring an obviously moderate return commonly earned in recent normal times, could ordinarily be determined without resort to property appraisals at a time when unit prices are unprecedently high and the cost of the requisite appraisal alone might approximate the yearly increase in revenue requested."

Objections to Zones Heard

A hearing was held at Pittsburgh on June 8 before W. D. B. Ainey, Chairman Public Service Commission of Pennsylvania, on the protest filed by the city against the fare schedule of the Pittsburgh Railways effective on June 20 which provides for an initial 5-cent zone in the business district of Pittsburgh with 2 cents in zones within restricted limits outside of that district.

Fred L. Franks, engineer of the City Transit Commission and witness for the city, suggested an alternative to the zone plan as proposed by the railway, but this was characterized by the attorney for the receivers as highly impracticable. The proposed zone system was also opposed by E. K. Morse, City Transit Commissioner. He said that, for one thing, the 5-cent zone as planned to be established by the company would stop two blocks short of practically the most important transfer point in the city. He was not opposed to the zone system as a system, but considered that the proposal of the company contained glaring inequalities.

After the company announced that it had closed its case, Commissioner Ainey addressed himself to the attorneys of the company saying that they had not made out a good case for the reintroduction of a double fare at night. This statement was generally construed as a notice to the railway that the commission would not allow it to re-establish the 10-cent night fare.

As an alternative to the 5 and 2-cent zones, it has been proposed that the fare be made 6¾ cents for all passengers through the sale of fifteen tickets for $1.

Trenton Service Case Concluded

Attack, defense and counter attack with the Trenton & Mercer County Traction Corporation, Trenton, N. J., the battle ground, featured the oral argument before the State Board of Public Utility Commissioners on June 11 in the application of the city of Trenton for improved railway service. Frank S. Katzenbach, Jr., who appeared for the company, in his review of the testimony submitted in the long-drawn-out case, declared that the company could not be charged with failure to give safe, adequate and reasonable service, while George L. Record, who as special counsel for the city, appeared with City Counsel Charles E. Bird, argued that the evidence had shown a breaking down in the system in the way of service. Martin P. Devlin, representing the labor unions, declared that the company has failed in its duty towards the people. The utility commissioners reserved decision.

Mr. Katzenbach raised a legal question relating to the commission's power in the present application to issue an order binding the leased lines making up the system controlled by the Trenton & Mercer County Traction Corporation. He argued that as the leased companies had not been made parties to the proceedings any order for improvements could not be carried out by the corporation without the consent of the leased companies. Another point he made was that if the city would meet the company's proposition as to street pavement the extension of the West State Street line to Trenton Junction would in all likelihood be agreed to by the company. He thought the company should be met by the city entirely in a spirit of fairness.

Transportation News Notes

Even in Sunny California.—The Stockton (Cal.) Electric Railroad has filed with the State Railroad Commission of California an application for permission to charge a 6-cent fare in Stockton.

Portland Case Set for June 18.—Arthur S. Benson, clerk of the Supreme Court of Oregon, announced on May 22 that the case of the city of Portland against the Public Service Commission of Oregon, known as the 6-cent fare case, has been set for hearing on June 18.

Kansas City Decision Expected by July 1.—David E. Blair, a member of the Public Service Commission of Missouri, is reported to have said that it is probable the commission will report before July 1 its findings on the Kansas City Railways application for an increase in fares.

Would Increase San Diego Fare.—The San Diego (Cal.) Electric Railway has applied to the State Railroad Commission for permission to raise fares. The application says that the company has paid no dividends since 1914 and that its surplus is rapidly being absorbed by expenses.

W. B. & A. Wants Three Cents a Mile.—The Washington, Baltimore & Annapolis Railroad applied to the Interstate Commerce Commission on June 15 for permission to raise its fares to 3 cents a mile, in conformity with the rate on steam roads, and to cancel all special and excursion rates.

Canadian Fare Cases Reviewed.—The *Canadian Railway & Marine World* for June, 1918, contains a review of sixteen cases in which increased fares are an issue on Canadian electric railways. Some of the more important of these cases have already been reviewed in the ELECTRIC RAILWAY JOURNAL.

Experiment with One-Man Cars Postponed.—The Public Utilities Commission of Utah at the request of the employees of the Utah Light & Traction Company suggested that the experiment with one-man operation be postponed until after the hearing on June 11 on the application of the company to charge 1 cent each for transfers.

Automobile Versus the Street Car.—Owing to the increasing number of accidents between automobiles and the cars of the Rhode Island Company, Providence, R. I., this company has issued an eleven-page circular asking the cooperation of drivers of gasoline-propelled vehicles. The material and illustrations in the pamphlet make it very clear that careless driving is the great automobile crime.

Fare Increase Proposed for Des Moines.—The Des Moines (Iowa) City Railway without waiting for permission from the City Council to increase fares will refuse to sell six tickets for a quarter. According to an announcement which has just been made the company will refuse to supply further orders of tickets and will await the injunction suit rather than placing the matter before the City Council.

Many Advanced Tariffs Filed.—There are fifty-nine utility companies in Pennsylvania which have filed with the Public Service Commission tariffs showing increases in their rates and fares on or about July 1. Among these are nineteen electric companies, ten electric railways, nine natural gas, six artificial gas, seven telephone, three water and one ferry, steam, sewage, baggage transfer and pipe line companies.

Municipal Line Would Increase Freight Rates.—Thomas F. Murphine, superintendent of Public Utilities of Seattle, Wash., has presented to the City Council a communication requesting that freight rates on the municipal railway to Lake Burien be increased. The rate schedule now in use was adopted three years ago. It had as its basis a schedule that had been in effect for ten years.

Men Join in Fare Plea.—Hearings have begun on the appeal of the Stark Electric Railroad, Alliance, Ohio, to the City Council for permission to increase its fares in that city. The union of employees has addressed the City Council in behalf of the company. The men "respectfully ask and implore you favorably to consider an ordinance allowing the Stark Electric Railway the privilege of increasing fares on city lines."

Would Increase Fares to Eight Cents.—The Northern Cambria Street Railway, Patton, Pa., has filed notice with

the Public Service Commission of Pennsylvania of its intention to increase fares from 5 cents to 8 cents. The property of the company was sold under foreclosure recently to the representatives of the bondholders. An account of the sale of the road under foreclosure was published in the ELECTRIC RAILWAY JOURNAL for May 11, page 933.

Skip Stops in San Diego.—By order of the United States Fuel Administration the skip-stop system has been placed in effect on route 1 of the San Diego (Cal.) Electric Railway between Fir Street and Mission Cliff Gardens, and between Twelfth and Market and Sixteenth and N Streets. On route No. 11 the plan is in operation between Park Boulevard Junction and Kensington Park. In as short a time as possible the system will also be placed in operation on routes numbers 5, 6 and 8.

City Commission Doubtful of Authority.—The City Commission of Battle Creek, Mich., has decided that it cannot legally grant the 6-cent fare requested by the Michigan Railway without first submitting the question to the people. As an alternative it is said the railway could decide to live up to the exact terms of the franchise which the commission has refused to amend. This would mean a straight 5-cent fare, with no transfer privileges, twenty minute service, and a 15-cent fare to the lake.

Grand Rapids Wants Six Cents.—The Grand Rapids (Mich.) Railway has petitioned the City Commission for permission to increase its passenger fares to 6 cents. The request has been referred to a special committee appointed by Mayor Gallmeyer. The application was presented on June 3. It was republished in full in the Grand Rapids papers over the signature of Benjamin S. Hanchett, president and general manager of the company, for the information of patrons of the company and the general public.

New Round-Trip Seattle-Tacoma Rates.—The Puget Sound Electric Company, Seattle, Wash., has filed with the Public Service Commission a new tariff for its round-trip passenger rates between Seattle and Tacoma and Seattle and Puyallup over its electric interurban lines. The new rate will be $1.50 for the round trip instead of $1.35 as at present, and include 11-cent war tax. This is an increase of 14 cents to the company and 1 cent for the government. The new rates are to become effective on June 24.

For Hire Jitneys Restrained.—In a recent decision the Supreme Court of Washington held that the Puget Sound Traction, Light & Power Company is entitled to an injunction against "for hire" jitneys operating under a Bellingham ordinance. The court held that the Bellingham city ordinance, which purports to give the jitneys authority to operate, is in violation of the State law, and that the temporary injunction should be kept in force until such time as the defendants comply with the bonding statute.

I. T. S. Would Cancel All Special Rates.—The Illinois Traction System has petitioned the Public Utilities Commission of Illinois for permission to cancel all thirty-day and special round-trip rates and commutation tickets. The company's petition cites the fact that it has had to stand increases in wages, cost of coal and all other materials in like proportion to the steam railways. It contends that only partial relief is requested, as it is not asking an increase in the present one-way passenger fare, which is based on 2 cents per mile.

Seven-Cent Fare for Wilmington.—An order permitting the Wilmington & Philadelphia Traction Company, Wilmington, Del., to increase its fares from 5 to 7 cents, effective from June 10, was made by the Public Utility Commission on June 5. Called upon by the City Council to explain its action the commission stated that the company is required to sell four tickets for a quarter. It is asserted that the report of an expert shows that the company is losing money and that if the city of Wilmington had not come to the aid of the company the government would probably take over the lines and charge such fares as it saw fit.

Tuscaloosa Wants a Six-Cent Fare.—The Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala., has asked permission to increase its rates on gas, electricity and electric railway fare. A committee of five representative citizens will be named to investigate the financial conditions confronting the company and to make such recommendations as the committee may deem advisable. The company wants a 6-cent fare. According to I. W. Ross, vice-president and manager of the company, the deficit of the company for 1917 was $32,000. Mr. Ross frankly stated that the first three months of 1918 convinced him that the deficit for the present year would be much greater than for the last year.

Women Conductors in Baltimore.—In an announcement made on June 5 the United Railways & Electric Company, Baltimore, Md., informed the public that it would place women conductors on some of its cars as soon as they could be recruited and trained. T. A. Cross, president of the company, in his statement, pointed out the growing difficulty of filling vacancies caused by men withdrawn for service in the army and navy and in munition and arms plants, and the necessity of calling upon women to fill these jobs. No men will be displaced. Women will be used only in such positions as are made vacant by men who leave. The women will be paid the same wages as men. Rest rooms and other conveniences will be provided. Women will be put in service only on prepayment vestibuled cars.

Increase in Tunnel Fare Postponed.—Announcement was made on June 8 from Washington that pending investigation no increase was to be made in passenger fares on the Hudson & Manhattan Railroad connecting Manhattan and the New Jersey shore. When announcement was made on June 6 that the Hudson tube fare would be increased to 10 cents for a single ride there was prompt criticism of the action in New York and New Jersey. The proposed increase was referred to in the ELECTRIC RAILWAY JOURNAL for June 8, page 1115. The increase was to have gone into effect on June 10. The determination to countermand the previous notice advising the public of an increase was announced late on June 8 by Wilbur C. Fisk, president of the Hudson & Manhattan Railroad, in the following statement: "We have been advised by the assistant director of the division of traffic that the Director General has decided that for the present no change should be made in the rates of fare of the Hudson & Manhattan Railroad, and that the subject will receive immediate careful study. Therefore, our tariffs covering the increased rate of fares have been withdrawn and there will be no change either in the rate of fare or in the method of collection until and when further orders are received from the Director General."

New Publications

Corporation Accounting

By R. J. Bennett, C. P. A. Ronald Press Company, 20 Vesey Street, New York, N. Y. 563 pages. Cloth, $3.

This new manual by Mr. Bennett covers in an excellent way the features of corporation law which the accountant should understand, and it presents in full detail the accounting technique of maintaining corporate accounts and records and preparing statements. The book is replete with practical points arising in all sorts of corporate situations, and illustrative entries, problems and exhibits are many.

Corporate Organization and Management

By Thomas Conyngton. Ronald Press Company, 20 Vesey Street, New York, N. Y. 778 pages. Cloth, $5.

This volume is a non-technical, practical and compact manual of corporation law and procedure for business men, corporation officials and attorneys. While business law is naturally affected by the continual changing of state laws, Mr. Conyngton's book gives as thorough and as up-to-date treatment of the subject as could be desired. It covers all phases of corporate organization and management, and is amply supplied with citations, precedents and working forms. The book is a revision of the author's "Corporate Organization" and "Corporate Management," superseding these widely-used works.

M. C. Brush to Turn Over Boston "L" to State

This Article Outlines the Stages of Mr. Brush's Career Which Led Logically to the Presidency of the Boston Elevated and to His Advocacy of the New Plan of Management

After two very strenuous and fruitful years in the presidency of the Boston Elevated Railway, Matthew C. Brush is about to turn the management of the system over to the commonwealth of Massachusetts which will manage it for at least ten years through five trustees. In thus arranging with the Legislature for the preservation of this important property during the crucial period which will exist until the public is willing to pay to private managers a reasonable price for electric railway transportation, Mr. Brush has accomplished the most important work in his transportation career. Through this accomplishment the rights of the investors will be conserved and the public will be furnished with the transportation which it desires. Mr. Brush will tender his resignation of the presidency to the trustees immediately upon their appointment in order that they may have a free hand in selecting their own executives. Obviously under the new scheme, which he advocated so ardently in the best interests of all concerned, he could not have the freedom of action which would be necessary to enable him to carry out his own ideas as to what is best for the further development of the property.

Mr. Brush has crowded so much of achievement into the seventeen years since he graduated from the Massachusetts Institute of Technology that a brief review of his career, summarizing in part what has appeared in previous issues of the ELECTRIC RAILWAY JOURNAL, cannot but prove stimulating to other ambitious young men who are planning for the future. It should also prove a worth-while object lesson to the industry as a whole.

Mr. Brush's career divides itself into three periods. The first of these was that in which he was acquiring a technical education and along with it experience in meeting people and in laying foundations for his later work in trying to furnish good transportation service. The second period was a short one spent in the mechanical departments of steam railroads in the West, where problems in maintenance of equipment and in management of men were studied. The third period, covering the past fourteen years, consisted in applying the previously acquired experience to the operating problems of electric railways.

Throughout his life Mr. Brush has had to work hard for what he got, and with very little outside assistance he put himself through the Armour Institute of Technology and the Massachusetts Institute of Technology, graduating from the former in 1897 and the latter in 1901. During his student days he worked at various capacities on the passenger boats operating on the Great Lakes, finally becoming purser on an important boat plying between Buffalo and Duluth. Here he learned important lessons in public relations, and also made many firm friends who were later of great assistance to him.

After graduation from "Tech" in 1901 he was employed in the Union Pacific repair shops at Omaha, Neb., becoming successively machinist, foreman and roundhouse foreman. Later he was with the Chicago, Rock Island & Pacific Railroad as general foreman in charge of roundhouses and shops of the company in western Kansas. All



M. C. BRUSH

of this was accomplished in the space of two years.

In 1903 Mr. Brush began his service with electric railways, spending the best part of six years with the Boston Suburban Electric Company, whose service he entered in 1903 as assistant to the president. He was soon afterward elected vice-president. The year 1909-1910 he spent as general manager of the Buffalo & Lake Erie Traction Company. His connection with the Boston Elevated Railway dates back to the fall of 1910 when he was made assistant to the vice-president. In 1912 he became second vice-president and later received a virtual promotion when the two vice-presidents of the company were equalized in authority. He was elected to the presidency of the Boston Elevated Railway in 1916.

While with the Boston Suburban Mr. Brush had to struggle with the financial problems of the company and among these was that of securing greater income. He advocated the 6-cent fare. He was successful in improving greatly the financial status of the company, as well as establishing friendly relations with the public. The welfare of his employees also deeply concerned him, and he later was able to apply his ideas along this line in a broad way on the Boston Elevated System.

What Mr. Brush has done for the Boston Elevated Railway is fresh in the minds of the readers of this paper so that all that need be said now is that he has built up a compact organization, has made the public feel its interest in the welfare of the property and has secured a hearing for his progressive and comprehensive convictions as to how pressing problems of electric railway transportation must be solved. In 1914 after serving as vice-president for several years and as acting president for part of one year he became president of the American Electric Railway Transportation & Traffic Association, holding this position for one year. In 1917 he was elected to the board of directors of the Second National Bank, Boston, an honor which he very highly prized.

From what has been said it will be evident that Mr. Brush's career has been characterized by consistency and definiteness of purpose. Everything that he has done has contributed to his progress and to preparation for large executive responsibilities. He recognizes this fact and endeavors to impress upon those about him the importance of the doctrine outlined in his recent address to the Rhode Island Company Section of the American Electric Railway Association. Above all Mr. Brush attributes his success to his practice of forming and keeping friendships by showing a willingness to serve those with whom he comes in contact. While a purser on the Great Lakes he attracted the attention of passengers, among whom were several noted capitalists, by the way in which he addressed them and looked after their comforts during the voyage. A distinct influence upon his future work resulted from associations formed during these college-purser days.

Mr. Brush is but forty years of age and has been a general manager since he was not more than three years out of college. His career has been a brilliant one and should form a fitting preparation for even larger responsibilities than those he has just laid down. During his two years as president of the Boston Elevated Railway he has had the double task of supervising the operation of an enormous property under unprecedented difficulties, and on the other hand of dealing with the public in a comprehensive way and bringing to fruition a plan for insuring continuity of transportation service with justice to all concerned while the whole electric railway situation is confused. His work at Boston particularly has illustrated the progressive spirit which must animate the whole industry if it is to accomplish its best work.

Personal Mention

L. L. Campbell has been appointed assistant general auditor of the Illinois Traction System, Champaign, Ill., to succeed George R. McComb, recently appointed assistant treasurer.

H. E. Johnson has been appointed auditor of disbursements of the Illinois Traction System, Champaign, Ill., to succeed L. L. Campbell, who has become assistant general auditor of the company.

D. H. Shapiro has been appointed private secretary to Frank R. Coates, president of the Toledo Railways & Light Company, Toledo, Ohio. He succeeds A. H. Stocksteil, who is now secretary of the Doherty Men's Club, Washington, D. C.

C. R. McMahon has been appointed master mechanic of the Des Moines City Railway and the Inter-Urban Railway, Des Moines, Iowa. He was formerly connected with the Utah Light & Traction Company, Salt Lake City, Utah.

E. B. Smith, formerly with the Arkansas Valley Railway Light & Power Company, Pueblo, Col., has been appointed auditor of the Muskogee Gas & Electric Company, Muskogee, Okla., succeeding J. H. Schmidt, who has recently resigned to enter business for himself.

Charles T. Doerr, purchasing agent of the Birmingham Railway, Light & Power Company, has resigned to accept an assignment as local purchasing agent, stationed in Birmingham, Ala., for the Air Nitrates Corporation, agents for the United States government in the construction and operation of the nitrate plants at Sheffield, Ala.

L. G. Mann, secretary to P. S. Arkwright, president of the Georgia Railway & Power Company, Atlanta, Ga., and a short time ago elected assistant secretary of the company, has been called to the Naval Reserve. Mr. Mann volunteered for the service some time ago and was accepted, but he continued his duties while waiting to be called for service.

Isaac W. Gross has resigned from the motive power department of the New York (N. Y.) Railways to become New York manager of the General Devices & Fittings Company. He became connected with the New York Railways immediately after his graduation from Harvard University in 1911 with the degree of electrical engineer. At the time of his resignation from the railway, and some years prior, he was in charge of all electrical investigations. He also had charge of all the electrical testing in the department and general company illumination.

George R. McComb has been appointed assistant treasurer of the Illinois Traction System, Champaign, Ill., to succeed W. H. Carnahan, deceased. Mr. McComb entered public utility work in 1901, when he took charge of the office of the Consumer's Heat & Electric Company, Bloomington, Ill. In 1905, when this company and a competing company were acquired by the Illinois Traction Company and consolidated he retained charge of the office of the combined property. In 1909 he was transferred to Champaign, where he has held various positions in the general accounting department of the Illinois Traction System to the present.

Darton L. Babcock has joined the auditing department of the J. G. White Management Corporation, New York, N. Y. After spending several years in the service of banking institutions in Binghamton, N. Y., and New York City, Mr. Babcock entered the public utility field as an accountant. In 1915 he became connected with A. B. Leach & Company, New York City, being placed in charge of their accounting and financial routine. In 1916 he was appointed manager of the Cincinnati office of W. E. Hutton & Company, stock brokers, from whose employ he resigned to join the staff of the J. G. White Management Corporation.

F. L. Hinman, who for the past five years has been master mechanic of the New York State Railways, Syracuse lines, today severs his connection with that company to become associated with the United States Ordnance Department with headquarters at Watervliet Arsenal, Watervliet, N. Y. Mr. Hinman has had a very consistent career in electric railway work covering a period of fifteen years. He has had large plans for equipment maintenance on the Syracuse lines, and has exercised ingenuity in devising ways and means for cutting down costs. The articles which he has contributed to this paper from time to time indicate the direction in which his chief interests lie. He has also co-operated in the preparation of articles to which his name was not attached. He has been particularly successful in his relations with the numerous mechanics under him by his constant endeavor to assist them in making the most of themselves. Beginning as apprentice in the Syracuse Rapid Transit Company shops, he was successively a general mechanical shop and power-house assistant with the Auburn & Syracuse Electric Railway, at Auburn, and storeroom clerk, storekeeper, chief clerk to chief engineer W. J. Harvie, general mechanical foreman and finally master mechanic with the Rapid Transit Company and its successor, the New York State Railways, at Syracuse. This experience should have fitted him admirably for the mechanical and stores phases of ordnance work.

Oscar S. Straus, chairman of the Public Service Commission for the First District of New York, has notified Governor Whitman that he desires to retire from his office not later than July 1, next. Mr. Straus became chairman of the commission on Dec. 20, 1915. He refused to accept the place for the full five-year term, and it was understood that he would retire at the expiration of two years. He explained then that the work he had been called upon to do was finished, but his objections were overcome, and the Governor obtained from him a promise to remain for a while longer. The commission, since he has been its chairman, has been entirely reorganized, both regarding its personnel and its methods of doing business. The most important of the new rapid transit lines are in operation, and on July 1 or a short time thereafter the two lines on Seventh Avenue and Lexington Avenue will probably be running. During his tenure of office as chairman, Mr. Straus has taken a prominent part in the settlement of many labor disputes and has worked indefatigably to bring about the early completion of the new dual system of rapid transit. Mr. Straus was born in 1850. He was graduated from Columbia University in 1871. Later he practiced corporation law for a time. Then he began a career in diplomatic and public life, during which he was honored by appointment to foreign diplomatic posts by three Presidents and served under another in the cabinet. In 1912 he was the nominee of the progressives for Governor of New York State.

Obituary

Charles F. Freeman, aged sixty-three years, former president of the Rapid Transit Street Railway, Dallas, Tex., known as the South Belt Line, died at a sanitarium in Dallas on May 30. Mr. Freeman helped to organize the Rapid Transit Company and was president of the company up to the time the property was sold to Stone & Webster.

Alfred R. Miller, treasurer of the Canadian Westinghouse Company, Hamilton, Ont., is dead. Mr. Miller entered the service of the Canadian Westinghouse Company, as bill clerk in 1897, was promoted consecutively to head bookkeeper in 1903, acting assistant treasurer in 1904 and assistant treasurer in 1907. He has been treasurer of the company since 1917.

Nils M. Thorsson, assistant purchasing agent of the Chicago (Ill.) Surface Lines since 1914, died on June 6 at the age of fifty-one years. For twenty-five years previous to 1914 Mr. Thorsson was employed by the Chicago Railways, a predecessor of the present system, in the purchasing department, part of the time as purchasing agent of that company.

Arthur B. Hicks, for five years special agent for the Puget Sound Traction, Light & Power Company, Seattle, Wash., in the detection of crimes against the company's property, died in Seattle on May 24 from spinal meningitis. Mr. Hicks was born in Rose, La., forty-two years ago. He had been in the employ of the Stone & Webster interests, in various capacities, for more than fifteen years.

C. W. D. Miller died at his home in Cakland, Cal., on May 31. Mr. Miller, A. H. Pomeroy and A. W. Bishop organized the Berea (Ohio) Street Railway. Later this company was succeeded by the Cleveland & Berea Street Railway, which is credited with constructing the first interurban railway in the country. The line connected Cleveland and Berea and formed the basis of what is now the Cleveland, Southwestern & Columbus Railway. The original company also built lines at Sandusky and Mount Clemens, Mich. In 1896 Mr. Miller's health compelled him to give up his business in Ohio and he moved to Santa Barbara, Cal., where he purchased a local railway operated by mules and afterward arranged for the change in the motive power to electricity.

Charles Harvey Hile, secretary of the New England Street Railway Club and editor of its official publication, the *Street Railway Bulletin*, since Oct. 25, 1917, died at his home in Boston, Mass., on June 4, at the age of fifty-four. Mr. Hile was best known for his connection with the Boston Elevated Railway over a period of about twenty years, where he ultimately became assistant to the vice-president and then chief of maintenance. He was graduated in 1892 from the Pennsylvania State College, taking the mechanical engineering course, and later took a post-graduate course in electric railway engineering at the University of Wisconsin. He saw service in the organization of the Philadelphia Traction Company before going to Boston. In 1910-1911 he was president of the New England Street Railway Club. During the past few years Mr. Hile's health has been precarious, and about a year ago he spent a protracted leave of absence at Washington, D. C., in hopes of regaining it. His kindly personality, breadth of technical knowledge, and wide acquaintance with men in the electric railway field in New England combined to render his appointment as secretary of the club last year peculiarly fortunate. During the short period of his secretaryship he did much to improve the appearance and make-up of the club paper and to stimulate the interest of the membership in public relations. Mr. Hile had a host of friends in engineering and electric railway circles who feel his passing to be a personal loss. Representatives of the ELECTRIC RAILWAY JOURNAL bear tribute to his cordial co-operation in all matters affecting club publicity. The impress of his quiet but constructive work will be felt for a long time in the affairs of the club.

Construction News

Construction News. Notes are classified under each heading alphabetically by States.
An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Foster Traction Company, Elkhart, Ind.**—Incorporated at Indianapolis to operate the line of the St. Joseph Valley Traction Company. Capital stock, $10,000. Directors: W. H. Foster, William E. Wider, Marion E. Brady, Eugene Atkins and Joseph Kies

Franchises

Oakland, Cal.—The city of Oakland has authorized the construction by the Emergency Transportation Company of a line connecting the plant of the Moore & Scott Iron Works shipbuilding plant with the San Francisco-Oakland Terminal Railways on Eighth Street. The line will be single track, for the use of the 6000 men employed in the shipyards. Under the plan agreed upon, the United States Shipping Board will furnish the funds and will control the line, while the materials will be furnished by the San Francisco-Oakland Terminal Railways. The total cost of construction will be $20,000. W. R. Alberger, vice-president and general manager of the San Francisco-Oakland Terminal Railways, is president of the Emergency Transportation Company. [May 18, '18.]

Dallas, Tex.—The Dallas Railway has received a franchise from the City Council to construct new track on Jefferson Street from Commerce Street to Young Street.

Track and Roadway

Little Rock Railway & Electric Company, Little Rock, Ark.—This company reports that it expects to construct 1 mile of track, material for which has been purchased.

British Columbia Electric Railway, Vancouver, B. C.—Work has recently been completed by the British Columbia Electric Railway on the rehabilitation of its line from New Westminster to Chilliwack, which was badly damaged by storms and floods during the past winter.

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway is constructing about 6500 ft. of second track on its line between Long Beach and Wilmington. This line is approximately 7 miles long and connects Long Beach and San Pedro harbors. Double-tracking is taking place on that portion of the line most needed, while the balance of the single track line will be improved with the installation of a three-position all-electric automatic block signal layout. This improvement is being made in the interest of moving with dispatch large numbers of laborers employed in shipbuilding plants located at Long Beach and Los Angeles harbors and to facilitate the movement of freight trains without interruption to passenger schedules. The company recently placed in operation 3030 ft. of second track on its Gardena-San Pedro line at Los Angeles harbor to facilitate more expeditious dispatching of passenger trains handling some 4000 employees engaged in the Los Angeles Shipbuilding & Drydock Company's plant, and to increase facilities for more adequately handling carload shipment of construction material for various industries located in the West Basin of the Los Angeles harbor. The company also recently completed and placed in operation approximately 15,000 ft. of second track on its Los Angeles-San Bernardino line. This line accommodates some of the heaviest running schedules of any line on the system.

Ocean Shore Railroad, San Francisco, Cal.—This company reports that it will install a Nachod highway crossing signal.

Gary (Ind.) Street Railway.—An extension will probably be built by the Gary Street Railway on East Fifth Avenue to the Aetna guncotton plant, 2 miles east of Broadway.

Louisville (Ky.) Railway.—A report from the Louisville Railway states that the company plans to reconstruct about 3 miles of single track during this season.

Attleboro, Mass.—A bill has been signed by Governor McCall permitting the city of Attleboro to purchase and operate portions of the defunct Taunton & Pawtucket Street Railway within the city limits. Work will be begun at once repairing the road from Attleboro to Briggs Corner.

Boston (Mass.) Elevated Railway.—Operation has been begun on the extension of the Boston Elevated Railway from Summer Street extension to the South Boston Fish Pier.

Duluth (Minn.) Street Railway.—Plans are being made by the Duluth Street Railway to extend its lines from South Superior to Oliver.

Independence, Mo.—The city of Independence, Mo., by private subscription of business men, is arranging for the location of an electric line from Independence to Sugar Creek, the latter being a

small industrial settlement with a cement plant and refinery about a mile and a half from Independence. About $13,000 of the estimated total of $50,000 for the construction of the line has been subscribed. The Kansas City Railways Company will construct and operate the line. A preliminary survey has been made.

Portsmouth, Dover & York Street Railway, Dover, N. H.—The Public Utilities Commission of Maine has rendered a decision declaring that the Great Works bridge in the town of South Berwick is unsafe for street railway use and that repairs must be made. The materials for such repairs are to be furnished and the labor performed by the Portsmouth, Dover & York Street Railway.

Public Service Railway, Newark, N. J.—A contract has been awarded by the Public Service Railway to the Eastern Construction Company, Brooklyn, N. Y., for the construction of an extension on Chestnut Street, Newark, a distance of about ½ mile.

New Jersey & Pennsylvania Traction Company, Trenton, N. J.—Extensive repairs are being made by the New Jersey & Pennsylvania Traction Company to its bridges across the Delaware River at Calhoun Street. New planking is also being laid between the tracks crossing the structure.

International Railway, Buffalo, N. Y.—Operation has been begun by the International Railway on its new fast service line from Buffalo through Tonawanda, North Tonawanda, Gratwick and La Salle to Niagara Falls.

Interborough Rapid Transit Company, New York, N. Y.—The opening of the new Seventh and Lexington Avenue subways has been postponed until about July 15. Recently the Public Service Commission for the First District of New York announced that the lines would be opened to the public on June 15, but complications have made it necessary to set the date forward at least a month. One of the most important changes that will take place in the operation of the subway system when these two new lines start running will be the diverting of travel from the Grand Central subway express station to the new Times Square subway express station. Broadway trains will then cease running across Forty-second Street to the Grand Central Station. They will proceed down Seventh Avenue past the Pennsylvania Station, and uptown trains to be had at Fulton Street, Astor Place, Thirty-third Street, or any of the subway stations south of Grand Central will not cross over to Times Square, but will curve into and proceed up Lexington Avenue.

Union Railway, New York, N. Y.—The franchise committee of the Board of Estimate has denied the application of the Union Railway for permission to give up the construction of a trolley line to connect the present Union Railway line with the Dyckman Street Ferry. The committee requested that the work on the new line be completed within six months. The new line is to begin at the 207th Street bridge, extend to Nagle Avenue, thence south to Dyckman Street and west to the ferry.

Sandwich, Windsor & Amherstburg Railway, Windsor, Ont.—This company proposes to divert about 8 miles of its line through the property of the Canada Steel Company, near Ojibway, Ont., by moving the line back about ⅛ mile. It also plans to lay a second track on a portion of this diverted line during the summer.

Philadelphia, Pa.—The committee on street railways of the City Councils of Philadelphia has reported favorably on an ordinance authorizing the Philadelphia Railways to construct an extension from its southwestern trolley line to the Hog Island shipbuilding plant. The Emergency Fleet Corporation will finance the extension and be reimbursed by the company later.

Hull (Que.) Electric Company.—Work has been begun by the Hull Electric Company on the double-tracking and paving of its line on Montcalm Street from Aylmer Road to Montclair Avenue and the Chelsea Road, about 1½ miles.

Dallas, Tex.—The Texas Electric Railway, the Dallas Railway Company and the Northern Texas Traction Company have ordered a carload of standard steel ties from the Standard Steel Tie Company of Dallas, and will make a thorough test of these ties under local conditions.

Dallas (Tex.) Railway.—The City Commission of Dallas has issued an order directing the paving of Beacon Street from Columbia to Tremont. Of the cost, the Dallas Railway must pay $4,834 and the city and property owners the balance.

Orange, Tex.—Announcement has been made by officials of the Chamber of Commerce of Orange that negotiations are under way and are near consummation which will insure a street railway system for Orange. It is understood that the Stone & Webster Corporation is considering installing car lines in Orange to serve the shipyards and other industries.

Seattle (Wash.) Municipal Street Railway.—The Board of Public Works of the city of Seattle will come to a decision in the near future as to the clearances to be allowed steam railway tracks over which the elevated structure of the Seattle Municipal Street Railway will pass in the industrial district. The question is in the hands of a special committee of the board, consisting of Thomas F. Murphine, superintendent of utilities, City Engineer Dimock and Charles R. Case, superintendent of streets. Railroad men and engineers, including W. E. Weeks, safety appliance engineer, employed by the government railway administration, argue strongly for a 9-ft. clearance. Such a clearance would add about $16,000 to the cost of the elevated line. The clearance plan at present calls for a clearance of 8 ft. on straight line and 80 ft. 6 in. on curves.

Power Houses and Substations

Los Angeles (Cal.) Railway.—The Los Angeles Railway has just ordered two General Electric and two Westinghouse 1500-kw. commutating pole, self-starting rotary converters, together with the necessary 50 cycle, 15,000-volt oil-insulated, self-cooled transformers. These machines will replace equipments intended for stand-by service.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—It is reported that the Wilmington & Philadelphia Traction Company will apply to the War Finance Corporation for a loan to assist in the installation of two new boilers and also for the installation of a rotary converter in the company's plant, as recommended by the Public Utilities Commission.

Manhattan City & Interurban Railway, Manhattan, Kan.—A report from the Manhattan City & Interurban Railway states that it expects to purchase a second-hand 200-kw. rotary converter.

Kansas City (Mo.) Railways.—A contract has been awarded by the Kansas City Railways to L. Breitag & Son Construction Company, Kansas City, for the construction of a new substation, 43 ft. x 82 ft., at a cost of $25,000.

Portland Railway, Light & Power Company, Portland, Ore.—Projects of the Portland Railway, Light & Power Company to increase the power facilities in Portland by development of water rights on the Clackamas River, involving an expenditure of $1,550,000, have been approved by John R. Lewis, state engineer. One of the projects approved is for the appropriation of 667 second-feet of water, together with the waters of the Clackamas River for development of 10,000 hp. The proposed plans will involve the construction of a flume 4 miles long, with a power plant, to cost about $1,250,000. Another application calls for the construction of the Timony Meadows reservoir on Oak Creek in Clackamas County of 40,400 acre-feet of water. This project includes the construction of a dam 80 ft. high and 440 ft. long, to cost about $300,000. These projects were started by the company several years ago and later dropped.

Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa.—Construction has been begun by the Chambersburg, Greencastle & Waynesboro Street Railway of a large new steel tower to be located near the new building of the company just completed in East Main Street. The tower will be fed from Security, Md.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—A permit has been granted to the Puget Sound Traction, Light & Power Company for the erection of a reinforced concrete smokestack, 225 ft. high, to cost about $15,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Southeastern Roads Not Buying Much

Spotty Purchases Bring Totals Lower Than Previous Year—Operating Costs Increased

A survey of the street railway field covering the Southeast, together with information obtained from manufacturers, indicates that practically no large apparatus is being bought. A few inquiries are in circulation for the exchange of old car equipment for new, but it is not expected that any transactions along this line will be consummated now, as the occasion is not propitious even though the new equipment would effect operating economies. While the volume of sales for maintenance and upkeep materials covering the entire section remains comparatively steady, hand-to-mouth and spotty buying has tended to force the total to lower levels than those reached during the same period last year.

Not a few companies have reached their capacities and little or no reserve remains, which certainly leaves narrow margins to work on when the present factory and transportation conditions are taken into consideration. There are a number of properties that would like to install additional generating capacity and order new rolling stock, but in most of these instances earnings are not sufficient, and relief in the way of increased fares is coming slowly. The utilities are hedged around with numerous difficulties such as a scarcity of money with accompanying high rates of interest; increasing cost of materials and labor, the latter hard to secure; increasing operating ratios where the margins are growing less each day.

From data secured up to and including February, 1918, on operating revenues and expenses covering the so-called Southern district, south of the Potomac and east of the Mississippi, operating ratios have increased 4.33 per cent over the same period in 1917.

Although the Capital Issues Committee has advanced funds to several utilities so far, the tendency toward decreased net revenues does not look encouraging for any great measure of financial relief from this quarter, in view of the fact that the committee requires a strong financial report before lending the necessary funds.

The labor item is especially acute at cantonment centers and coastal cities where new shipyards are being located. Ordinarily unskilled labor at these points was plentiful at $1.50 per day, but it is almost impossible to get workmen now for $2.50 per day. This condition is to be expected when shipyards will pay 40 to 60 cents per hour for the same class of workmen. It has been reported that there have been times when schedules were curtailed owing to the shortage of platform crews, combined with the lack of shopmen and inspectors.

Production of Bituminous and Anthracite Coal

Improved Transportation Conditions Result in Increase of Weekly Output —Efforts for Clean Fuel

For the week ending June 8 the production of bituminous coal showed a decrease, for the period closing June 1 of 1,025,000 net tons or 8.7 per cent. The output of soft coal (including lignite and coal made into coke) is estimated at 10,774,000 net tons as compared with 11,779,000 net tons during the week of May 25, according to estimates furnished by the United States Geological Survey. The operators reporting produced 77 per cent of total production or 92 per cent of total rail shipments. These 5072 mines were operated to 75.8 per cent of their present capacity, while the mines reporting for the week ended May 18 were operated at 76 per cent. It will be noted that the increase in production for the week ended May 25 compared with the week of the 18th amounted to 0.7 per cent, whereas the per cent of present capacity as reported by the operators decreased 0.2 per cent. In all fields increased production is attributed mainly to improved transportation conditions.

The Federal Fuel Administration has just issued regulations governing the preparation of bituminous coal. Anthracite coal has been inspected for a long time and is being carefully prepared to insure good fuel. Certain shippers of "snow bird" coal from the anthracite region have been stopped by the local administrators, greatly to the satisfaction of the anthracite industry, for the anthracite operators are insistent for clean coal for the consuming public. In every contract between operators and miners, as agreed to and upheld by the United Mine Workers, there is a penalty on miners who load impurities with coal that could reasonably be kept out.

It would take a miracle to get 100 per cent perfect production of anthracite and this the Fuel Administration is aware of and fully recognizes without undue comment. Anthracite compares well in preparation with any other product of large consumption.

Pressure of Conditions in Small Tool Market

Cogent Remarks by a Leading Manufacturer—Distribution of Products on an Even Basis

At the convention in Cleveland, Ohio, on May 15, 16 and 17 of the Supply & Machinery Industry Manufacturers, several interesting addresses were delivered. One of the prominent manufacturers in the small tool field, Richard T. Law, sales manager of the Standard Tool Company, Cleveland, in speaking on the war situation called attention to certain prevailing conditions by saying:

"If the increased demand for small tools had been uniform it would have been a comparatively simple problem, but it wasn't. On some sizes the demand has remained about the same, on others the demand has increased 400 and 500 times. When you stop to consider that the machinery we use is not to be found in the open market, but must be made in our own shop, you have some idea of the magnitude of the work.

"Some sizes we carry in stock, others we have orders ahead for fourteen months. Formerly we kept 30,000 sizes and kinds of tools in stock, but not so to-day. So anticipate your needs as much as possible. It is well to be cautious for the future is obscure. This is not a good time to speculate. The products should be distributed evenly and where they will do the most good. The war industries and government are coming in for large amounts. Do not wait until you are out for a thing before ordering. It is the man who has kept ordering small orders month after month and has had the goods gradually dribbling through all the time that is selling the small tools to-day."

Railway Motor Market Conditions

Regular Sizes Easier to Obtain on Short Delivery—Accumulated Stock Reports—Price Changes

With the buying of electric railway equipment generally estimated on a minimum scale, the supposition was indulged in that a stock of railway motors had been gradually accumulating. This led to a special inquiry on the part of the ELECTRIC RAILWAY JOURNAL, with diverse results. One of the companies which manufactures this class of equipment stated, through the chief of its railway department, that the stock of railway motors is

nil. No accumulation had been attempted during the lull in buying, other work of more immediate and pressing importance being given attention. Each order for railway motors was special, and its acceptance, completion and shipment was subject to individual treatment at the factory. Deliveries could not be promised under six or eight months, unless a priority order was forthcoming.

Another company of equal reputation stated it was surprising how many railway motors were being bought. A number of traction companies were rapidly discarding their old equipment, replacing it with improved devices, especially in motors.

Deliveries of motors of 40 hp., the same company declared, could be made out of stock in from six to eight weeks, which would be considered a hurry order. Special motors could not be shipped under a year. This company has a large if not a greater accumulation of motors on hand at present than in normal times.

Within a year prices on railway motors have advanced from time to time. Since the war the figures have gone up 75 per cent. During the last six weeks an increase of 10 per cent was made by one manufacturer. This is supposed to be about as high as this class of equipment will go, but manufacturers who were consulted were not altogether positive as to what may occur in the future, considering the position of steel and other essential material. Another 10 per cent price increase was announced by all the principal motor manufacturers.

Women Employees in a Railway Supplies Plant

Skilled Men Desert Posts for Higher Wages—Acute Conditions Relieved by Female Substitutes

It is doubtful whether any one place has been so disrupted by labor troubles and shortage as Philadelphia, Pa. The belief is that every industry has been made to feel what the loss of skilled workmen means. In Philadelphia, however, and its tributary territory, so many important war industrial enterprises—publicly or privately owned and conducted—of great magnitude, needing thousands of employees, that every other manufacturing concern has had its factory staff drawn upon. The draft almost crippled some plants and others are kept in operation only by the employment of women.

Of course, this is no innovation. Other firms elsewhere have gradually been taking on women operatives more or less to their advantage. The Electric Service Supplies Company, Philadelphia, whose transactions prior to the war with traction roads and power houses was 85 per cent of its business and is still 35 per cent, which is considered very satisfactory, has had a peculiar experience. The company has an unusually attractive plant from the point of air, light, perfect ventilation and location. Before the great shipyards, munition plants, powder mills and other war activities were in full swing the company had a corps of skilled machinists and metal workers equal to that of any plant in the electrical field.

When the Hog Island and other shipyards in the vicinity were offering unheard-of wages, the men deserted almost in a body. A few returned who had been rejected as not measuring up to the high standard of competency established by the ship workers. One of the munition plants in the neighborhood seeking high grade steel workers and machinists kept the Electric Company figuring how it could retain a few, at least, of the men actually needed by meeting any reasonable advance in wages.

Even common, unskilled labor, retained for physical work only, is receiving from $3 to $3.50 a day. At that men are hard to get and hold.

With all its trouble and determination to keep the plant operating at 100 per cent efficiency, in the meantime having received a number of large government contracts, the company displayed no rancor toward its old employees. It started in to fill the gap by employing women. A few weeks ago a number of girls were engaged for light work. Everything in the way of proper surroundings was provided. A special matron was employed to look after the physical well-being and comfort of the women. Rest rooms were set aside and equipped, as they are necessary and desirable. Careful instructions were given by competent men and in a remarkably short time the girls were found to be more adaptable and efficient than the men who had preceded them. While learning a fair wage is paid to the women, and when competent to assume the task, workmen's full compensation is accorded. This alone greatly pleases the female operatives.

Much to the company's surprise it found the new workers more conscientious and painstaking than men. More real interest is shown in the tasks allotted. Their usefulness is gradually being extended, stamping machines are being operated and other work assigned them in which women's natural deftness and intelligence is peculiarly fitted.

Their skill and the general results are reported as very satisfactory and gratifying. The conduct and appearance of the men about the plant has also undergone a transition with the presence of the girls. The improved deportment of the men is also a source of gratification. With this agreeable experience, the company is making arrangements to employ a large number of women in every department where their physical capacity will not be overtaxed.

This testimony to the worth of women in manufacturing plants is supported by the declaration of other firms in the electrical line elsewhere. Not only in Philadelphia, but in many other communities the labor situation continues tense and is growing worse.

Rolling Stock

Nipissing Central Railway, North Cobalt, Ont., Canada, expects to purchase one snowplow.

Manhattan City & Interurban Railway, Manhattan, Kan., is in the market for second-hand airbrake equipment.

Pacific Electric Railway, Los Angeles, Cal., controlled by the Southern Pacific Company, has ordered twenty safety cars from the American Car Company, with delivery in August.

Boston (Mass.) Elevated Railway has placed an order for six double-truck sweepers with the Russell Car & Snow Flow Company, Ridgway, Pa. Delivery is to be made in the fall.

Gary (Ind.) Street Railway, reported as being reorganized from the Gary & Interurban Railroad Company, is said to be contemplating the purchase of ten new cars for city service. Recently the company acquired six double-truck center-entrance cars—two motors and four trailers—of all-steel construction.

Richmond Light & Railroad Company, New Brighton, S. I., N. Y., is making preparations for buying twenty new cars of the closed type. Specifications are now being prepared and the order will be placed by the United States Shipping Board, Emergency Fleet Corfor serving the shipyard on Staten Island is considered inadequate for the extraordinary service required. Twelve open cars are now used, this number soon to be increased to twenty.

Inter-Urban Railway, Des Moines, Iowa, has a 70-ton electric locomotive on order with the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. This road's new locomotive equipment now includes two from the Westinghouse Company of 60-tons and 70-tons weight respectively, and one General Electric locomotive of 55 tons.

Boston (Mass.) Elevated Railway furnishes the following partial specifications for the 200 motor and 100 trail-cars under consideration, as previously mentioned in this paper.

Number of cars under consideration	200 motors, 100 trailers
Name of road	Boston Elevated Railway
Type of car	Center entrance passenger
Seating capacity	Motor 58-60; Trailer, 62
Weight (total)	Motor 44,000 lb.; Trailer 26,000 lb.
Bolster centers, length	24 ft. 0 in.
Length over bumpers; motor	48 ft. 9½ in.
Trailer	48 ft. 2½ in.
Width over all	8 ft. 8½ in.
Height, rail to trolley base	11 ft. 6½ in.
Body	Semi-steel
Interior trim	"Aero" metal-sash trim bronze
Headlining	Agasote
Roof, arch or monitor	Monitor
Couplers	Tomlinson
Designation signs	Hunter-Keystone
Door-operating mechanism	Pneumatic
Fare boxes	International Register Co.
Trolley catchers	Q. P. Signal Co.
Wheels (type and size)	25 in. steel

New Advertising Literature

Computer Manufacturing Company, San Francisco, Cal.: Folder, illustrated, describing the Ross precision computer, which multiplies and divides numbers instantly.

Combustion Engineering Corporation, New York, N. Y.: Bulletin C1, illustrating various installations of the method and operation of the "Coxe Stoker," the title of the pamphlet.

Wheeler Condenser & Engineering Company, Carteret, N. J.: Bulletin showing the Wheeler-Balcke cooling tower in numerous designs and capacities varying from a few thousand gallons per hour to nearly a million gallons per hour. Several pages are also devoted to the Wheeler-Barnard forced-draft cooling tower. The booklet is well illustrated with actual installations.

O. M. Edwards Company, Syracuse, N. Y.: Catalog H on trapdoors and fixtures. Illustrates different types of the Edwards all-metal trapdoor for steam and electric railway cars, including a new type of adjusting bracket and plug for trapdoors by which a very fine adjustment of the spring on these doors is obtained. The trapdoor lock, design H, is also shown. Views are given of several electric cars equipped with these doors.

G. & W. Electric Specialty Company, Chicago, Ill.: Catalog describing and illustrating its several distribution specialties. In this bulletin series cut-outs, filling compounds, ground-pipe caps and points, primary cut-outs and fuses, line disconnectors, cable and conduit hangers, outlet hoods, potheads, subway cut-outs, distribution boxes, switching boxes, spice boxes and tap boxes are described.

Ford, Bacon & Davis, New York, N. Y.: Illustrated description of Strawberry Dam on the south fork of the Stanislaus River, Cal., belonging to the Sierra & San Francisco Power Company. The structure is said to be the largest of its type in the West, namely a granite rock-filled dam, sealed with a reinforced-concrete apron and concrete toe wall to bed rock. The structure was designed and the construction supervised by Ford, Bacon & Davis.

Drew Electric & Manufacturing Company, Indianapolis, Ind.: A complete and comprehensive catalog describing and illustrating its overhead line material and electric railway specialties. It is known as catalog No. 18 and contains specifications and photographs of splices, trolley frogs, trolley crossings, adjustable crossings, section insulators, approachers, triple-beam insulators, pole brackets, line suspensions, feed-in hangers, insulated hangers, cap-and-cone hangers, globe strain insulators, giant strain insulators, standard insulated bolts, porcelain strain insulators, etc. It also contains various accessories used on electric railways. High voltage porcelain insulators are extensively treated and diagrams are given illustrating construction and sizes. Glass insulators are also described and illustrated.

Trade Notes

Railway Improvement Company, New York, N. Y., announces that it has received an additional order for eleven Rico coasting recorders from Stone & Webster for the Houghton (Mich.) County Traction Company.

The Parr Terminals Company, Wilfred N. Ball, engineer, 225 First National Bank, Oakland, Cal., desires manufacturers, jobbers and distributers to send him catalogs and other data on electrical materials or equipment used in the construction of piers, warehouses, industrial buildings, belt line railways and street work, cargo handling equipment; general shipyard and machinery equipment.

Liberty Steel Products Company, Inc., New York, with offices in the Woolworth Building, announces the appointment of J. W. Weinland, formerly manager of the brake-beam department of the American Steel Foundries, as district manager in charge of the Western sales office which has been opened at 1901-1903 McCormick Building, Chicago. The company also announces that S. W. Midgley has been appointed a special representative in the Western railroad sales department of the company. Mr. Midgley has been connected with railroad supplies during the last sixteen years in the sales departments of the National Car Coupler Company, Curtain Supply Company and Acme Supply Company.

NEW YORK METAL MARKET PRICES

	June 5	June 12
Copper, ingots, cents per lb	23¼	23¼
Copper wire base, cents per lb	26¼ to 26¾	26¼
Lead, cents per lb	7¾	7.25
Nickel, cents per lb	40	40
Spelter, cents per lb	7¼	7.62½
Tin, Chinese,* cents per lb	.90	.92
Aluminum, 98 to 99 per cent., cents per lb	†33.00	†32.00

* No Straits offering. † Government price in 50-ton lots or more, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	June 5	June 12
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	19	19
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6	6¼
Zinc, cents per lb	5¼	5¼
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	June 5	June 12
Rubber-covered wire base, New York, cents per lb	27 to 34	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	30½ to 30.40	34½ to 37.10
Weatherproof wire (100 lb. lots), cents per lb., Chicago	35.43 to 38.00	35.43 to 38.35
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 100 to 500-ton lots, per gross ton	$67.50	$67.50
T-rails (A. S. C. E. Standard) 500-ton lots, per gross ton	$62.50	$62.50
T-rails, high (Shanghai), cents per lb	4½	4½
Rails, girder (grooved), cents per lb	4½	4½
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3½	*3½
Tie plates (brace type), cents per lb	*3½	*3½
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3½	*3½
Angle plates, cents per lb	*3½	*3½
Angle bars, cents per lb	*3½	*3½
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount†	80%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount	80%	80%
Car window glass (double strength, all sizes AA quality), New York discount	82 & 3%	82 & 3%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13¼	13 to 13¼
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.50
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.50
Asphalt filler, per ton	$45.00	$45.00
Cement (truck lots), New York, per bbl	$3.20	$3.20
Cement (carload lots), Chicago, per bbl	$3.26	$3.26
Cement (carload lots), Seattle, per bbl	$3.60	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.58	$1.58
White lead (100 lb. keg), New York, cents per lb	10	10¼
Turpentine (bbl. lots), New York, cents per gal	52½	51½

* Government price. † These prices are f.o.b. works, with boxing charges extra.



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ELECTRIC RAILWAY JOURNAL

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HYDRAULIC DEVELOPMENTS
GAS WORKS
ELECTRIC RAILWAYS

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

AMERICAN BRIDGE COMPANY

HUDSON TERMINAL-30 CHURCH STREET, NEW YORK

Manufacturers of Steel Structures of all classes particularly BRIDGES AND BUILDINGS



Transmission Towers at Birmingham, Alabama. Alabama Power Company.

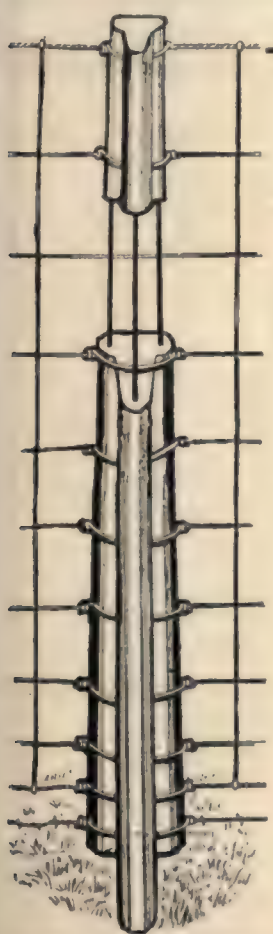
SALES OFFICES

NEW YORK, N. Y., 30 Church Street
Philadelphia, Pa. . Widener Building
Boston, Mass. .John Hancock Bldg.
Baltimore, Md., Continental Trust Bldg.
PITTSBURGH, PA. . . Frick Building
Buffalo, N. Y. . Marine National Bank
Cincinnati, Ohio. Union Trust Building
Atlanta, Ga. . . . . Candler Building
Cleveland, Ohio . . Guardian Building
Detroit, Mich., Beecher Ave. & M. C. R. R.
CHICAGO, ILL., 208 South La Salle St.
St. Louis, Mo., Third Nat'l Bank Bldg.
Denver, Colo., First Nat'l Bank Building
Salt Lake City, Utah, Walker Bank Bldg.
Duluth, Minn. . . . . Wolvin Building
Minneapolis, Minn., 7th Ave & 2nd St. S. E.

Pacific Coast Representative:

U. S. Steel Products Co. Pacific Coast Dept.
SAN FRANCISCO, CAL., Rialto Building
Portland, Ore. . . . . Selling Building
Seattle, Wash., 4th Ave. So. Cor. Conn. St.

Export Representative:
United States Steel Products Co., 30 Church St., N. Y.



Seven Posts to the Sack

Just to save a few dollars makeshifts are sometimes put in.
This is no time to put in a makeshift fence—and pay for it again in the future.
No time, especially when with

Standard Fence Post Moulds

All Steel ***McElroy System***

you can get seven standard posts out of each sack of cement—and keep your labor charge very low. Note the T-shape of the posts—a big saving there.

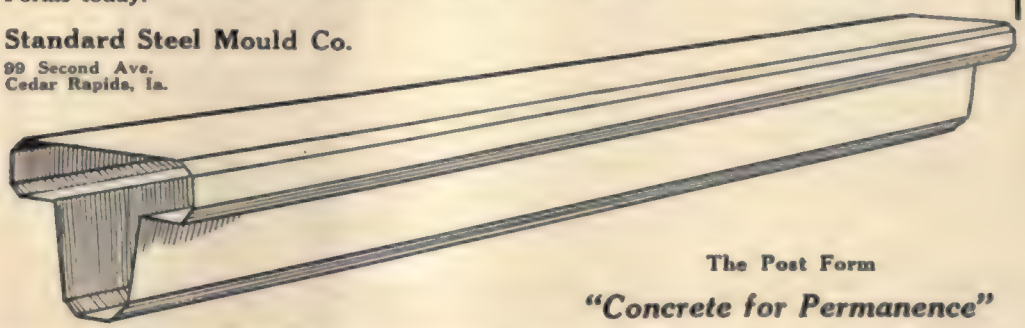
Assembled "Fool-proof" Towers insure uniform strength.

Why experiment? We offer you 20 years' experience as fence experts. Over 12 years of extensive manufacture of Concrete Fence Posts and Steel Moulds, handling hundreds of miles of fence contracts. More than a million posts in Iowa alone. Others in 38 States.

WE USE ONE-FOURTH-INCH ROUND DEFORMED BARS.

Write for full details of Standard Post Forms and Stan-Ste-MoC Building Rock Forms today.

Standard Steel Mould Co.
99 Second Ave.
Cedar Rapids, Ia.



The Post Form

"Concrete for Permanence"

Have it sent to your home

Why?

Electric Railway Journal's service is of permanent value

Every issue contains articles for which you may have no immediate use. You read them—they interest you—you store away their salient points in some crowded corner of your brain—and straightway forget them.

By and by occasions will arise

when you would give your head to be able to lay your hands quickly upon something you remember to have read in the Journal—not merely the high spots, but the detailed facts and figures.

If it's all your very OWN copy

you will read it regularly, and what you want is always at your service. If it's the Company's copy you are reading, after that first hurried perusal it is gone for good.

To get 100% efficiency out of your Journal

you must have your own individual copy—with no one else to share it with you or to mark or cut it up for you. You must have it sent to YOUR HOME, where you can have it all to yourself, where you can read it at your leisure, where you know where to find it when the hurry calls come for data of importance which you can get from no other source.

THIS YEAR

will witness many strides toward the permanent settlement of many of the burning questions now agitating the industry. These developments will leave their mark upon the common practice for years to come. You will want to refer to them repeatedly long after the present transition period is over. Beginnings are always interesting. The beginnings of many of the movements now in the bud are unusually so. They spell REVOLUTION all over—they forecast the entire reshaping of electric railway practice—many of their elements that now appear to be of minor import will hereafter be regarded of weighty consequence.

Get them all—get them for yourself
Get them permanently—get them at your home

TEAR OFF HERE

Electric Railway Journal, 10th Ave. at 36th St., New York, N. Y.

Enter my subscription for one year to the Electric Railway Journal. I will remit $3 in 30 days.

Name.....

Address.....

Company.....Position.....

(In Canada the price is $4.50. Foreign rate, $6) YOC-3

THIS COUPON

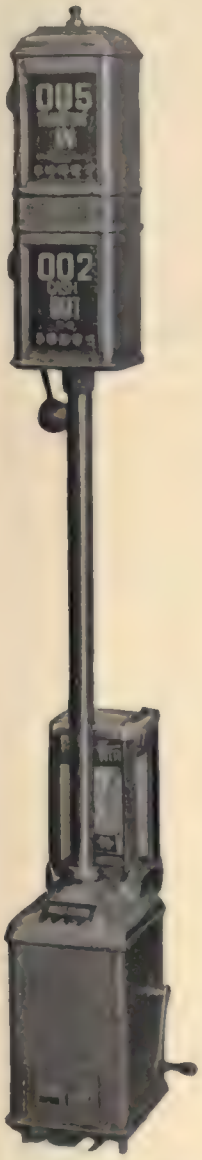
will insure them to you in the way they will be of the greatest service to you. Never mind the money now—simply fill in and mail the coupon at once—

TODAY

Last Word in Fare Collection

The International Coin Register

Collecting All the Fares



Metal Ticket and Type C20 Coin Transfer Register

The International combination of fare box and register all in one rugged unit.

This combination gets more money for the railway by insuring individual, conspicuous and accurate registration.

When you are equipped with the International you know that when the car returns from a trip every fare collected is registered. It's easy to see that such a combination will soon pay for itself.

Aside from collecting all the fares the International speeds up the fare collection. The conductor can handle a huge crowd of passengers in a few seconds with the International.

We also manufacture single and double registers; Coin Counting and Coin and Metal Ticket Counting Fare Boxes; Motor-Driven Station Registers; and are sole agents for Heeren Enamel Badges.

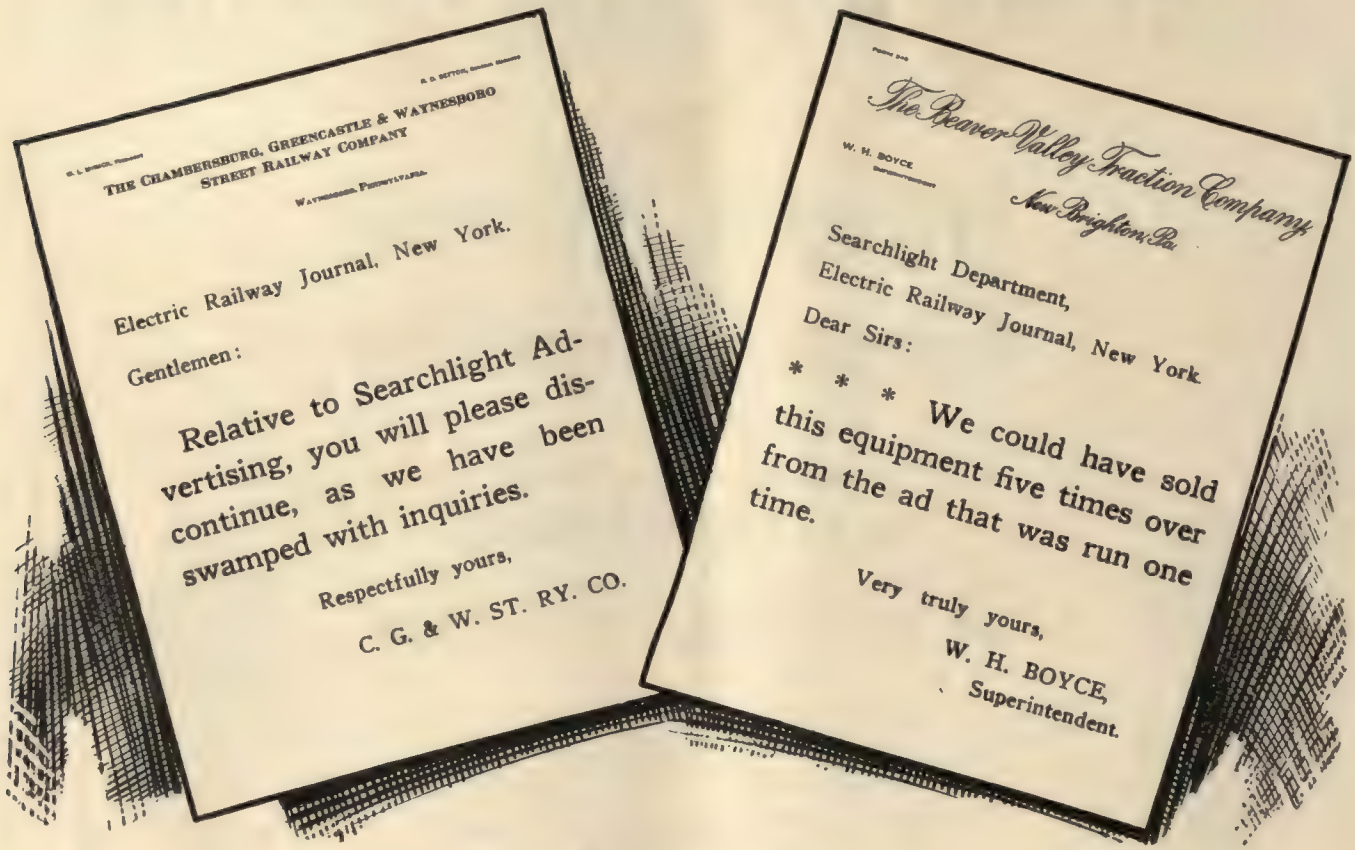
The International Register Company

15 S. Throop St., Chicago, Ill.



Type C14 Coin and Metal Ticket Register

Business is Booming!



Are you getting your share?

Second-hand equipment is commanding a premium. Look over your stock and convert it into cash. Send us the list.

Searchlight

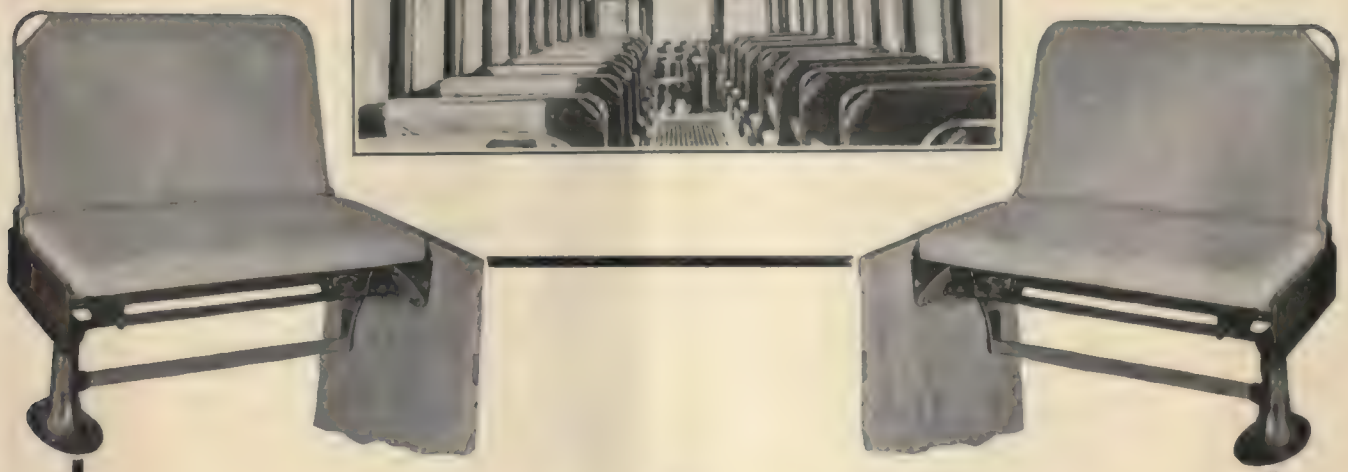
advertising

will find the anxious buyer for you.

SEND US YOUR LIST

Electric Railway Journal, 10th Ave., at 36th St., New York





Around the Continent on Hale and Kilburn Seats

Dayton, Ohio

The summer crowds that will ride on the Oakwood Street Railway Co.'s new cars to and from "Hills and Dales" will see in the Hale and Kilburn seats visible evidence that the Company thinks of passenger comfort. The "Walkover" pattern selected is fine for passengers and Company.

Its features, as you probably know, are light weight, neat appearance and simple construction. It gives maximum cushion length for a given over-all dimension. Ease of operation makes it less subject to deterioration. The small movement of the cushion allows a comfortable angle for the back without eating too much space. The Hale and Kilburn Corner Grip handle used in the new Dayton Cars is an evidence of thought for the standees. It prevents accidents caused by clumsy loops on seat backs because passengers do not have to twist or distort their hands to take hold—that means prevention of broken fingers or wrists due to sudden lurches.

There's a Hale and Kilburn Seat for each kind of service—all based on nearly half a century of experience in producing the right seat for any given requirement.

Hale and Kilburn Seats are specified for the country's most progressive roads because correct design, flawless materials and honest workmanship make an unbeatable combination.

WALKOVER

COPYRIGHTED

Hale and Kilburn Corp.

Philadelphia
Washington

New York
Atlanta
Chicago

San Francisco
Louisville

WALKOVER

COPYRIGHTED

Collier Service

at Houston, Texas

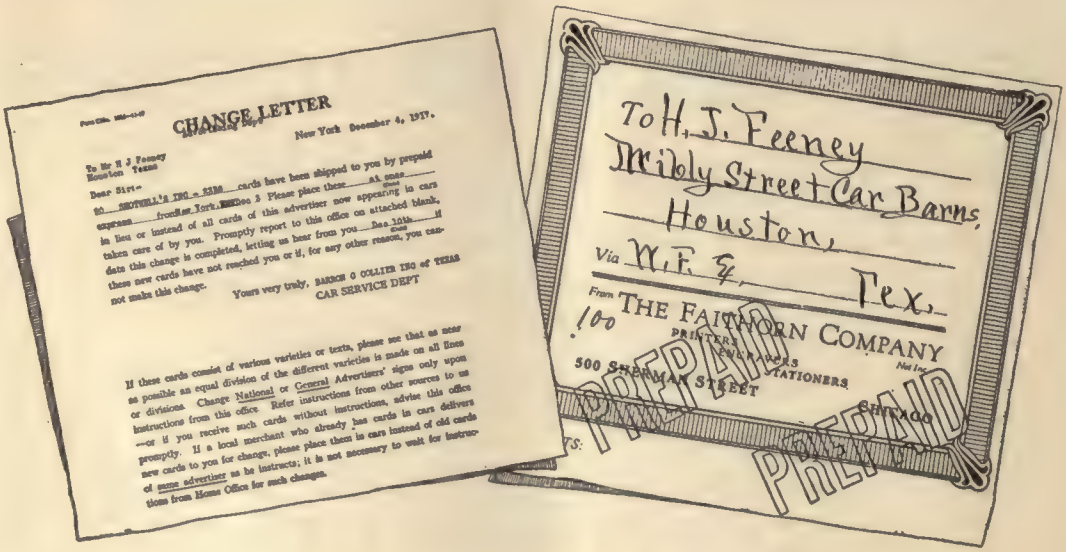
From the time that Collier Car Cards are announced as having been shipped to the time that they are carded, every step is subjected to most careful checking.

These matters may seem small in themselves. Doubtless we could save a lot of money by using fewer forms and depending upon the untrammeled notion of the individual car carders.

But we know that the only way of maintaining the merit of car card advertising is to see that the advertiser gets what he contracted for.

Hence we are just as anxious to see that cards are properly installed and exchanged as we are in their attractive design and printing.

Thus Collier Service assures to the railway a well-established value for its card space as an advertising medium.



Barron G. Collier INCORPORATED

Candler Building

220 West 42nd Street, New York City

Charlotte Has Been Boyerized for Four Years and not a Pin Replaced





More than four years ago the Southern Public Utilities Company, Charlotte, N. C., began to use Boyerized Brake Pins and Bushings.

Charlotte cars make 45,000 to 48,000 miles a year at a schedule speed of 9.5 m.p.h.

That means nearly 200,000 miles of service.

Yet not one Boyerized Pin has been removed for wear!

If it's safety and economy you are after, Boyerize!

ELECTRIC RAILWAY SUPPLIES

Bemis Car Truck Company

SPRINGFIELD MASS

10 to 15 Thousand Miles On a Single Journal Box Packing



Eliminate the costly and troublesome hot box and get far greater mileage out of a single Journal Box packing, at a considerable saving of oil by using the

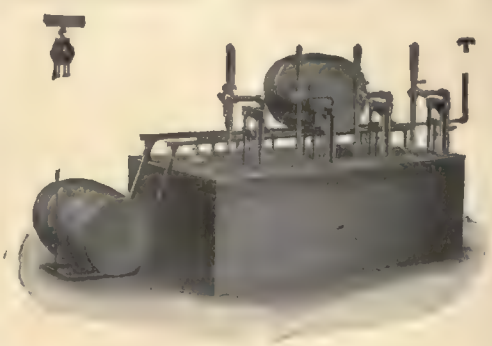
Milwaukee Waste Saturation System

This system saturates the waste **perfectly** and **thoroughly.** This assures constant lubrication of the bearings and reduces the Journal Box maintenance at least one-third.

Referring to the accompanying cut. The oil is kept in the lower compartment and the upper compartment is filled with waste. The oil is then drawn from the lower compartment, by means of the pump, and the waste is completely submerged in oil. It is left in this state for 18 or 24 hours. The handle (*B*) is then turned and the oil drains thru the screen (*D*) and back to the lower compartment thru the valve (*C*). After the waste has drained for about 24 hours it has reached a degree of perfect saturation which means 100% more mileage. The removable gauge stick (*A*) shows the quantity of oil in the lower compartment. The opening (*E*) is for cleaning or inspection.



Milwaukee Outfits Cut Your Oil and Labor Expense



We manufacture 30 different types of outfits for the economical storage and handling of such liquids as machine oils, cutting oils, kerosene, gasoline, etc. A Milwaukee Outfit will save you from 5 to 10 gallons of liquid on every barrel you use.

Write for our catalog of complete oil storage systems for Railways.

Milwaukee Tank Works, MILWAUKEE WISCONSIN

Manufacturers of oil storage outfits for Cleveland Railway Co., Chicago Elevated (all lines), Northern Ohio Traction and Light Co., Milwaukee Electric Railway and Light Co., and many others.

More-Jones Products

The exacting demands of war-time are bringing out the strong and weak points in every industry.

More-Jones products, whatever they may be, are made right. That is why they are generally recognized as the best being produced today.

For instance, the V-K oilless trolley wheel is made of new metal exclusively, extremely tough and long wearing, and in combination with the V-K Non-Arcing Harp, results in practical economies impossible with any other type.

Into More-Jones "Tiger" bronze axle and armature bearings are put the best selected material *plus* expert foundry practice, developed in over forty years' experience. Laboratory control and careful inspection insures the furnishing of perfect bearing structures.

Then think of More-Jones armature babbitt metal, the standard on American electric railways. Made of pure new metal perfectly amalgamated and of uniform composition. It is strong, tough, pliable and of the lightest obtainable bulk. Can be remelted and used over and over again.

The only way to overcome higher costs is by using equipment of higher efficiency.

More-Jones Brass & Metal Co.
St. Louis, Mo., U. S. A.

V-K









Columbia Brake Levers

No. 1 *Heating*

THE first step in the making of our brake levers is the heating of the rough shape preliminary to forging. It's hot work, done by experts who know the exact blush the iron should take before it is removed from the furnace. Step No. 2, the forging, will be illustrated next week.

Don't forget that we make many other things besides brake levers

Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St.

Brooklyn, N. Y.

TOOLS

Armature and Axle Straighteners
Armature shaft straighteners
Armature buggies and stands
Babbitting molds
Banding and heading machines
Car hoists
Car replacers
Coil taping machines for armature leads
Coil winding machines
Pinion pullers
Pit jacks
Signal or target switches
Tension stands

W. R. Kerschner Co., Inc., N. Y.
Holden & White, Inc., Chicago
F. F. Bodler, San Francisco
Railway & Power Eng. Co., Ltd., Toronto, Ont.



CAR EQUIPMENT

Armature and Axle Bearings
Armature and field coils
Bearings (Axle and Armature)
Brush-holders and brush-holder springs
Brake, door and other handles
Brake forgings, riggings, etc.
Car trimmings
Commutators
Controller handles
Forgings of all kinds
Gear cases (steel or mall. iron)
Grid resistors
Third-rail shoe beams and accessories
Trolley poles (steel) and wheels

The
QUALITY
MARK



The Tool Steel Gear & Pinion Co.
Cincinnati, Ohio

THERE ARE THREE VALUES FOR RAILWAY COMPANIES IN THE SPECIFICATION and USE OF

CYPRESS

"THE WOOD ETERNAL"

for Crossarms, Car Material, Fencing, Station Construction and Similar railway purposes:

First, the vastly longer life of the material itself. *All-Heart Cypress* is pretty nearly *proof* against the action of decay.

Second, the

SAVINGS OF LABOR COSTS IN YOUR MAINTENANCE WORK

Obviously the longer the serviceable life of the lumber you use, the less you are going to have to repair and replace. That of course means not merely saving in cost of material, but also saving in the much bigger item—*cost of labor.*

Third, when you specify Cypress you can know *definitely* that you get what you pay for IF you see THIS MARK; This mark is on the ends of every piece of Cypress cut by the responsible mills in this Association.

It is a guarantee that the material bearing it is made, *and graded at the mill,* in accordance with the scrupulously high standards demanded by this Association and the best customers of its members.

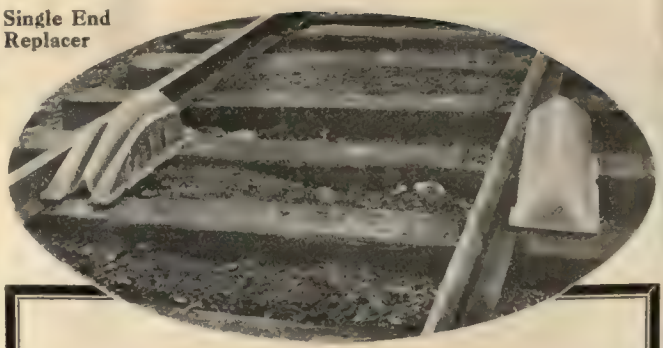
These *values* are worth *getting.* The *facts* are worth *remembering.*

Our data is at your service

SOUTHERN CYPRESS MFRS.' ASS'N

1265 Hibernia Bank Building, New Orleans, La., or 1265 Heard National Bank Building, Jacksonville, Fla.

Single End Replacer



Reading Replacers

Reading replacers are the handiest replacer on the market. The crew can easily carry Reading Replacers because they are light in weight but strong for work. They are made for all weights of equipment and all heights of rail.

Used the World Over

Reading Replacers are guaranteed for a period of one year. They are made for axle loads up to and including 78,000 lb. and will rerail equipment on rail 6½ inches in height.

The "B" Side-The-Rail-type replacer as illustrated below is suitable particularly for interurban lines.

Branches in large cities.

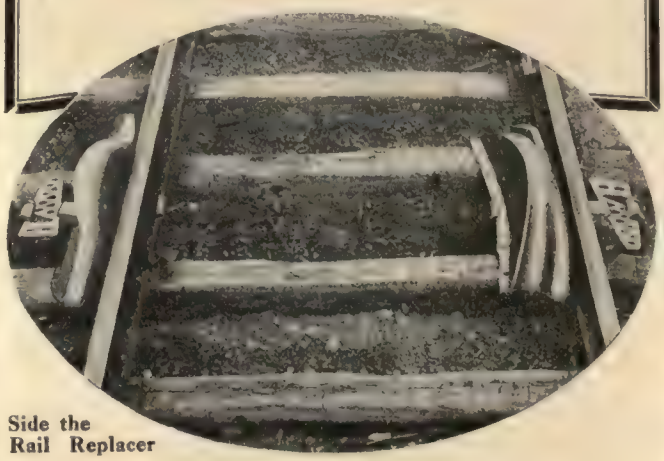
Manufactured and Sold by

The Reading Specialties Company

Reading, Pa.

Branch Offices:

New York, 111 Broadway; Chicago, 747 Railway Exchange Bldg.; Atlanta, Ga., 4th National Bank Bldg.; Washington, D. C., Colorado Bldg.; Denver, Colo., 1st National Bank Bldg.; Pittsburgh, Pa., 932 Oliver Bldg.; Los Angeles, Cal., H. W. Hillman Bldg.; St. Louis, Railway Exchange Bldg.



Side the Rail Replacer



No Flashover Points

INSTALL THE FRANKLIN AND FORGET IT
ELECTRICAL DEVELOPMENT AND MACHINE CO.
GENERATING STATION EQUIPMENT

FRANKLIN
Bus Bar Supports

have no clamped or cemented parts, no split fittings or other details likely to cause electrical or mechanical weaknesses.

They were designed by practical engineers on practical work; built according to the best mechanical and electrical practice; thoroughly strong, solid, rigid, uniform.

Write for illustrated bulletin.

SELLING AGENTS:
THE PHILADELPHIA ELECTRIC COMPANY SUPPLY DEPT.
132 South Eleventh Street, Philadelphia

EFFICIENCY — RELIABILITY — SIMPLICITY

Allis-Chalmers Steam Turbines

Show sustained economy after years of operation
Units built in sizes from 200 kw. up

District Offices

Atlanta, Ga.
Boston, Mass.
Buffalo, N. Y.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Dallas, Texas
Denver, Colo.
Detroit, Mich.
Duluth, Minn.
El Paso, Tex.
Kansas City, Mo.
London, England
Los Angeles, Cal.
Milwaukee, West Allis Works
Minneapolis, Minn.
New Orleans, La.
New York, N. Y.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
St. Louis, Mo.
Salt Lake City, Utah
San Francisco, Calif.
Santiago, Chile So. America
Seattle, Wash.
Toledo, Ohio



3200 KW., Max. 3600 R.P.M., H.P. Condensing Steam Turbine and Alternator. Unit of this size installed in the plant of the Eastern Pennsylvania Ry. Co., Palo Alto, Pa.

Allis-Chalmers Manufacturing Co.
Milwaukee, Wis.

For all Canadian Business refer to Canadian Allis-Chalmers, Ltd., Toronto, Ont., Canada

SHIELD QUALITY BRAND TAPES

are the result of many years of scientific study of the demands of the tape trade. They are well known by electricians as the tapes of perfect satisfaction.

SIXTEEN SHIELD BRANDS

have been constructed to meet the individual needs of the tape user. They are made of the finest materials the market affords.

We are sure one of these brands is just the tape to satisfy YOU.

United States Rubber Company

Mechanical Goods Division

New York

ALUNDUM FOR MANGANESE STEEL

Manganese steel is one of the toughest and hardest metals known—yet NORTON grinding wheels go right along literally biting off the metal. In the picture an ALUNDUM wheel 14x2½ in., grain 14, grade P, is removing ¼ in. of manganese at 1800 r.p.m. The grinding attachment used is a special one and is mounted on an ordinary lathe so that both the outside and inside of the bushing can be ground at one setting.



NORTON COMPANY

Worcester, Mass.

New York Store 151 Chambers Street. **Chicago Store** 11 N. Jefferson Street.

Electric Furnace Plants: Niagara Falls, N. Y. Chippawa, Ont., Can.

MACHINE TOOLS

For Electric Railway Repair Shops

WE are in a position to furnish complete machine tool equipment for electric railway repair shops, including steam hammers and electric traveling cranes.

Correspondence Invited.

OUR LINE INCLUDES

Axle Lathes, Car Wheel Borers, Hydraulic Wheel Presses, Shapers, Planers, Drills, Slotters, Bolt Cutters, Milling Machines, etc.



Car Wheel Presses, 200 to 600 Tons Capacity

NILES-BEMENT-POND CO.

GENERAL OFFICES, 111 BROADWAY, NEW YORK

Boston, Philadelphia, Pittsburgh, Cleveland, Cincinnati, Birmingham, Detroit, Chicago, St. Louis, San Francisco

Avoid Delay in Deliveries

Under present day conditions the rolling mills are giving preference to Government requirements resulting in uncertain supply and deliveries on private contracts.

Chillingworth Gear Cases are made from special deep drawn steel plate made especially for us, therefore we are dependent upon mill deliveries and tonnage to complete orders booked.

Anticipate your requirements and order now so that we can consolidate your order with others in our plate specifications to the mill, insuring greater tonnage from them and consequent quicker shipment of cases to you.

THAYER & COMPANY, Inc.
111 BROADWAY, NEW YORK CITY

Eliminate Brush Chatter—

Get Better Contact and Longer Commutator Life



Equip your motors with brush holders that provide constant brush pressure and hold the brushes securely under the heaviest jarring without the use of screws to become loose and give trouble. Equip them with

LINDALL Brush Holders

They hold the brushes in place with phosphor bronze springs without possibility of binding or sticking. A brush is easily inserted and removed for inspection.

The large contact between brush and spring makes the use of pigtails unnecessary.

Branches: New York, 135 B'way; Philadelphia, 429 Real Estate Trust Bldg.; Chicago, 105 So. Dearborn St. London, 48 Milton Street.

Albert & J. M. Anderson Mfg. Co.

289-93 A Street, Boston, Mass.

Established 1877

EMB Grid Resistors

ARE MADE RIGHT AND STAY RIGHT

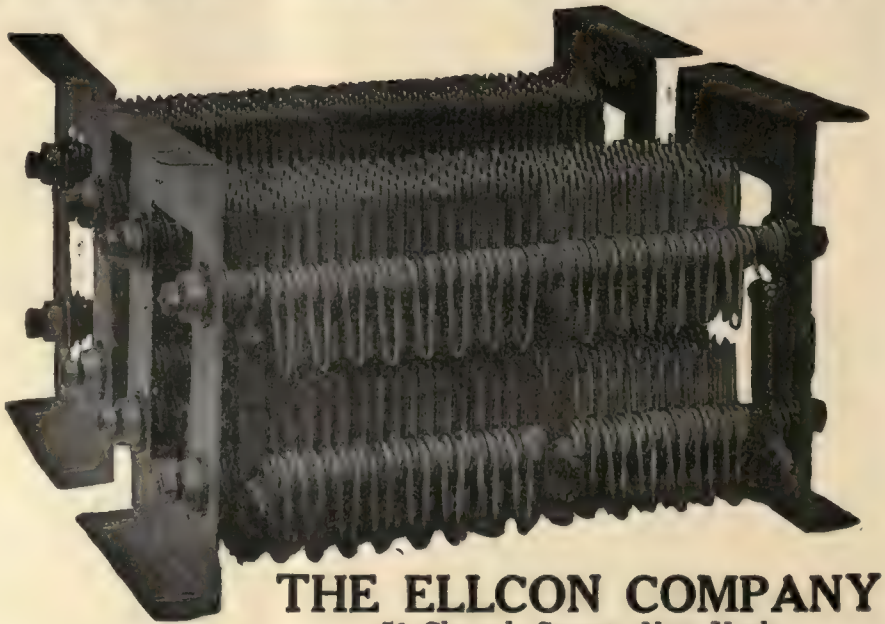
No resistors get more abuse than those under a car.

They are abused electrically by careless operation of the controller.

They are abused mechanically by exposure to dusty, muddy and stone-littered streets.

Until the arrival of E M B drawn, non-corroding grid resistors, troubles from these sources seemed unavoidable.

E M B grid resistors actually have made this part of your equipment troubleproof.



THE ELLCON COMPANY

50 Church Street, New York

A Timely and Patriotic Business Proposition

Cut Out the Waste!

NOW is the time to clean up!

Every piece of idle equipment, unnecessary material or scrap represents WASTE!

—*waste*

Money!
Time!
Space!
Labor!
Material!

—the *money* such equipment or material cost earns nothing and is not available for other use.

—the *time* it is idle is wasted when it can render service elsewhere.

—the *space* it occupies costs money and may be needed for other purposes.

—the *labor* of its manufacture is wasted and also the labor of producing a duplicate for the man who *can* use it.

—the *material* it represents would be a welcome addition to present short stocks.

Start your Spring clean-up with a resolve to cut out *all* this waste. Don't have material or equipment around that is not needed. Turn it into cash.

There never was a better market for either scrap or good used machinery. There never was a time when conservation of both materials and machinery counted for so much to the whole nation.

Buyers for junk or scrap are readily found in most localities. Buyers for material or good used machinery you don't need can best be reached through the *Electric Railway Journal* Searchlight Section.

If Electric Railway Officials Only Knew—

If you knew what a valuable collection of actual figures and practical information on the electric railway business Blake and Jackson's ELECTRIC RAILWAY TRANSPORTATION really is, you would put the book on your desk where it would be handy for constant reference.



Blake & Jackson's

ELECTRIC RAILWAY TRANSPORTATION

487 *pages*, 6 *x* 9—$5.00.

This book brings together the most valuable data on electric railways obtainable today. It is the first complete reference book on modern electric railway transportation methods and practice. It emphasizes the close relation between efficient transportation methods and financial success.

If you would look through the book, you would at once appreciate its practical value to you. Will you examine the book? We invite you to do so. As you will see by referring to the attached coupon you can examine Blake and Jackson for 10 days *free* without obligating yourself to purchase it. Surely it would seem good business to examine this book under these conditions. Simply tear out the coupon, fill it in, and mail it to us.

PARTIAL CONTENTS

- Adjustment of Service
- Accelerating Traffic Movement
- Car Types
- City Timetables
- Interurban Schedules
- Fares
- Fare Collection Practices
- Public Relations
- Promotion of Traffic
- Freight and Express
- Wage Agreements
- Welfare Work

FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc.,
239 West 39th St., New York, N. Y.

You may send me on 10 days' approval:

Blake and Jackson Electric Railway Transportation, $5.00 net.

I agree to pay for the book or return it postpaid within 10 days of receipt.

I am a regular subscriber to the Electric Railway Journal.
I am a member of A. I. E. E. or A. E. R. A.

Signed.....

(Address).....

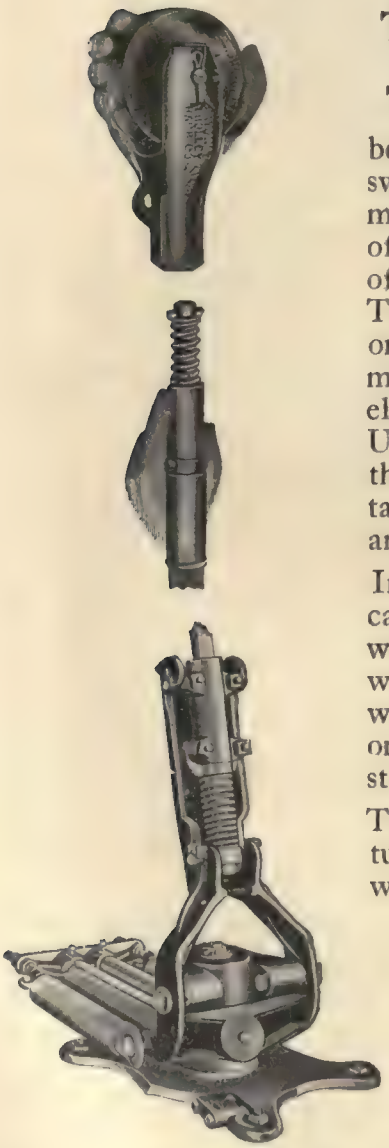
Reference.....

(Not required of subscribers to the Electric Railway Journal or members of A. I. E. E. or A. E. R. A. Books sent on approval to retail customers in U. S. and Canada only.)

E-6-15-18

BAYONET TROLLEY EQUIPMENT

Saves Money and Increases Profits and Savings



The Patented "Bayonet" Trolley Base

because of its easy swivel and rotating motion, assures you of perfect alignment of the trolley wheel. The roller bearings on which it is mounted practically eliminate friction. Uniform pressure on the wire is maintained at any pole angle at all times.

In ten seconds you can change the harp without tools, simply with a "twist of the wrist." In sixty seconds you can substitute a new pole.

There are other features which a trial will demonstrate.

Let us send you a set—base, harp and trolley wheel — to test on one of your cars at our risk!

Ask for our Catalog

Bayonet Trolley Harp Co.

Springfield, Ohio

FORD TRIBLOC



Easy Operation at Any Angle

Don't let the progress of the work lag because of a hoist's shortcomings. There is no reason why the hoist operator should get in the way of the machine operator if a Ford Tribloc Chain Hoist is used.

A Ford Tribloc can be easily, safely and efficiently operated at any angle as a result of the patented anti-gagging LOOP Hand Chain GUIDE. No other hoist quite like the Ford—ask why.

Ford Chain Block & Mfg. Company

Second and Diamond Streets, Philadelphia, Pa.

2138-D

"STANDARD"

Steel Tires — Steel Tired Wheels
Solid Rolled Steel Wheels
O. H. Steel and Malleable Iron Castings
Solid Forged Gear Blanks
Steel Forgings — Iron Forgings
Forged and Rolled Steel
Pipe Flanges
Ring Dies — Rings — Roll Shells
Steel Springs

ISI BRAND *"The 'Standard' Brand on your material is an assurance of eventual economy."* ISI BRAND

STANDARD STEEL WORKS CO.

GENERAL OFFICES:
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CHICAGO
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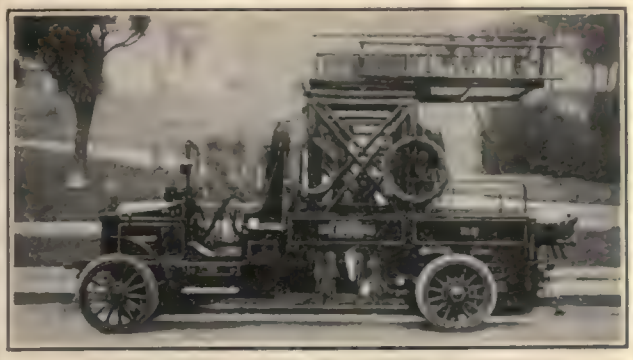
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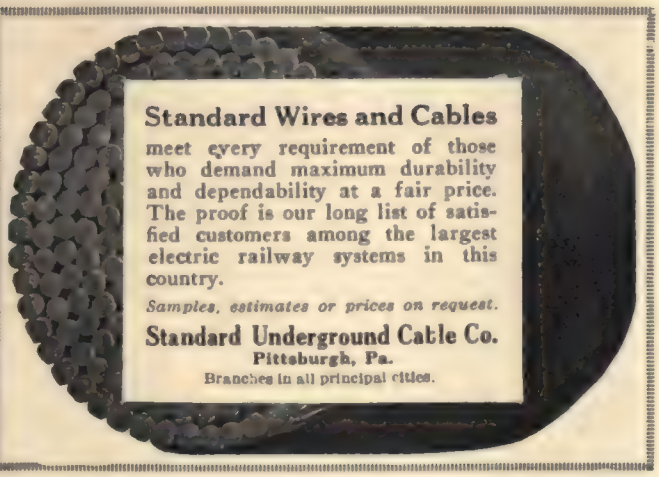
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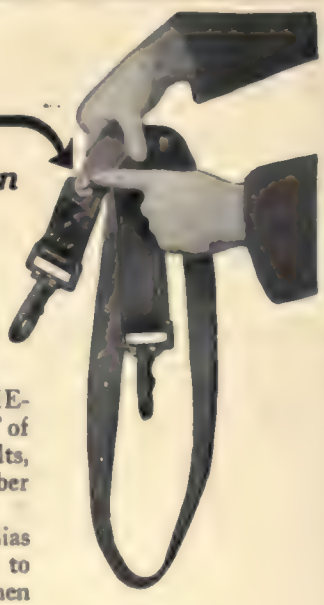
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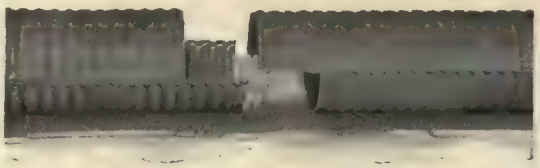
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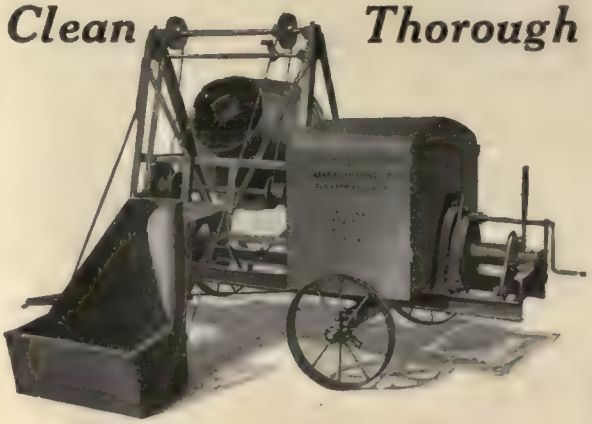
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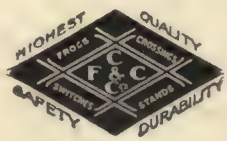


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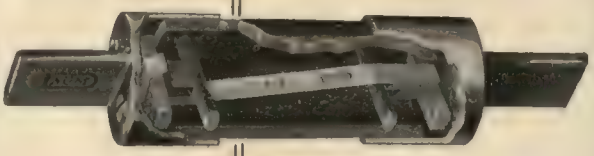
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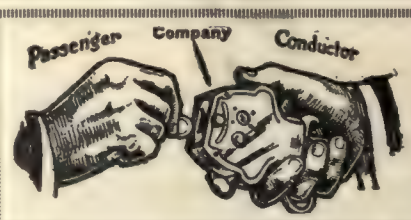
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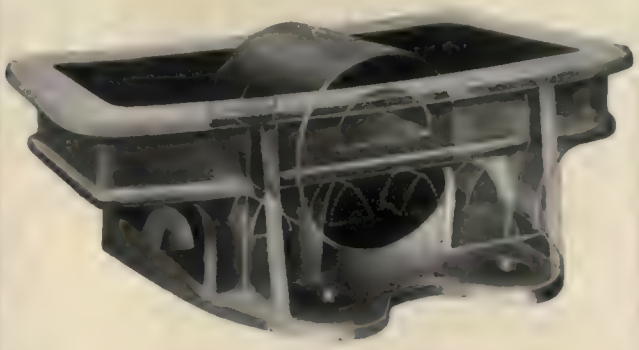


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200 tons 100 lb., with angles. New.
Full Stock, All Weights.

Interurban Cars

1—Combination, 38 ft. over platforms, 28 ft. inside. Passenger compartment 20 ft., baggage compartment 8 ft., seating capacity 36. Four G. E.-1000 motors. Double end control.
1—Passenger, 38 ft. over platforms, seating capacity 42. Two G. E.-1200 motors. Double end control.
Both in First-Class Condition.

ZELNICKER IN ST. LOUIS

GET BULLETIN 237—70 BARGAIN PAGES.

CLEVELAND ARMATURE WORKS
Cleveland, Ohio

Everything in the Line of Repairs to Electrical Machinery

Complete Armatures, New Armatures, Rewound Armature Cores, Armature Shafts, Armature Coils, Fields and Commutators.

Established 22 Years.

This advertisement

might be your own and get you the attention of other readers of ELECTRIC RAILWAY JOURNAL. They number over 7500.

Have you anything to sell them?

The Searchlight Advertising in This Paper

is read by men whose success depends upon thorough knowledge of means to an end—whether it be the securing of a good second-hand piece of apparatus at a moderate price, or an expert employee.

The Best Proof

of this is the variety of this journal's Searchlight ads. Without a constant and appreciable *demand* for such machinery or services, by its readers, the market-place which these advertisements represent could not exist for any length of time.

Are *you* using the Searchlight Section?

SEARCHLIGHT SECTION

Complete Power Plant

Delivery Approx. May 1st

2—780 KVA Westg. Turbo Outfits, 3-ph. 60-cy., 2400-V., 3600 R.P.M., complete with switchboards and exciter units; also condensing apparatus. 4-338 H.P. Keeler Water Tube Boilers with breeching, stack, pumps.

TURBINES

1—2500 KVA. Gen. Elec. Curtis Horz. Turbo Outfit, 2-phy., 60-cy., 2300-V., 3600 R.P.M., 150-lb. steam pressure, with Westg. Le Blanc Condenser.
1—500 Kw. Gen. Elec. Curtiss Turbo Outfit, 3-ph., 60-cy., 2300-V., 1800 R.P.M., 150-lb. steam pressure. Vert. type.
1—500 Kw. Westg. Horz., 3-ph., 60-cy., 360-V., 3600 R.P.M. Turbo Outfit.
1—100 Kw., Gen. Elec. Turbo Outfit, 3-ph., 60-cy., 2300-V., 3600 R.P.M., 125-lb. steam pressure.

ARCHER & BALDWIN, Inc.
114-118 Liberty St., New York, N.Y. Telephone 4337-4338 Rector

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FOR SALE

Ten sets United States Signal Company

BLOCK SIGNALS

with semaphores in excellent operating condition.

Good opportunity for small road to obtain block signals at reasonable price.

HOLYOKE STREET RAILWAY CO.
Holyoke, Mass.

FOR SALE

CARS

47 28-foot Pay-As-You-Enter Cars, mounted on Brill Maximum Traction 22-E Trucks.

MOTORS

6 G. E. 800 Motors, complete.

8 G. E. 1000 Motors, complete.

ARMATURES

25 W. H. 56 Armatures.

10 W. H. 68 Armatures.

For further particulars, apply to

W. R. Kerschner Company, Inc.
50 Church St., New York City

---

60 Tons

7-in. Girder Rails

P. S. Co. Section
No. 238

HENRY LEVIS & CO.
Commercial Trust Bldg.,
Philadelphia, Pa.

---

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.
We positively own these Rails and offer same in carload lots and over.
25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.
Immediate shipment guaranteed and prices very attractive.
Carload and less than carload inquiries and orders solicited.
Rails cut to length for structural purposes.
Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Building, Pittsburgh, Pa.

FOR SALE

POWER HOUSE MATERIAL

100 ft. 54-in. Smoke Stack. Large lot of Valves, Pipe and Fittings.

RAILWAY MATERIAL

Cars, Trucks, Controllers, Repair Parts for Westinghouse 12-A Railway Motors, 35-lb. Rail.

Ask for list.

Mobile Light and Railroad Co.
Mobile, Ala.

FREQUENCY CHANGER

Immediate Shipment

1000-Kw. Westinghouse Frequency Changer Set, 60-Cycle, 3-Phase, 2300 Volts: to 25-Cycle, 3-Phase, 6600 Volts. All on sub-base, complete with Starting Motor and all usual accessories.

PAUL STEWART & COMPANY
Large Electrical and Steam Power Apparatus
First National Bank Bldg., Cincinnati, Ohio.

Direct Current Belted Generator

1—500-kw., 550-V., 320 r.p.m. Cp. Wd. Westinghouse 3 bearing direct current generator.

DUQUESNE Electric & Mfg Co.

Write, wire or 'phone our nearest office, Pittsburgh, Pa., or 230 La Salle St., Chicago, Ill.

SEARCHLIGHT SECTION

RAILWAY MOTORS

40-50-hp. Interpole

Will sell or trade for old motors or other material

160—General Electric, No. 202, 40-hp. at 500-volts, 50-hp. at 600-volts. Complete with gears, pinions, gear cases, axle bearings, etc. Gearing, G. E. Grade M, heat treated; ratio 15-71; Gear Cases, malleable iron. Bearings are oiled from top.

Excellent Condition. **Low Price.**

4 G.E.	51-80 H.P.	60 Whs.	12	30 H.P.
26 G.E.	52-30 H.P.	210 Whs.	49	35 H.P.
4 G.E.	54-30 H.P.	26 Whs.	68	40 H.P.
2 G.E.	55-80 H.P.	2 Whs.	56	50 H.P.
12 G.E.	57-50 H.P.	16 Whs.	76	75 H.P.
28 G.E.	67-40 HP.	10 Whs.	306	.75 H P.
20 G.E.	216 New	12 Whs.	317	60 H.P.

ARMATURES CONTROLLERS CARS

TRANSIT EQUIPMENT CO.
501 Fifth Ave., New York

For Sale—Immediate Shipment

GENERATING UNIT

1—500-kw., D.C. Engine Type **Generator,** manufactured by General Electric Company, Serial No. 74903, Type M.P., Class 10-500-100, Form H, 525/575-volt, 870-amperes, 100-r.p.m., compound wound, complete with generator panel and equalizer pedestal; direct connected to

1—750-hp. Cross Compound Corliss **Engine.** This is a horizontal, non-condensing, heavy duty type engine, Serial No. 2052, manufactured by The Hooven, Owens, Rentschler Co., of Hamilton, Ohio. Hp. cylinder, 20 x 42 in.; L.P. cylinder, 40 x 42 in. for 150-lb. steam pressure, 100-r.p.m., equipped complete with hand operated throttle valves, hand oil pumps, sight feed lubricators and oil drip cups, and belt-driven fly ball governor, mechanically connected to both sides.

Generator weighs approximately 92,000 lb.; engine, approximately 18,000 lb.; unit is in first-class operating condition and is offered complete, subject to prior sale and for prompt acceptance, at $7500 on foundations within 40 ft. of railroad siding, or $8500 f.o.b. cars. This company has contracted with hydro-electric plant for power and therefore offers this unit at sacrifice.

For further information, write or wire us.

MACON RAILWAY & LIGHT CO.
Macon, Georgia

WANTED

50 tons of Shanghai

TEE RAILS

7 in. web preferred; advise quantity available, lengths, condition, price, location, and send sketch of section. Address

W-184, Elec. Ry. Journal

FOR SALE

Turbine Generator

Vertical type Curtis steam turbine generator, 500 K.W. capacity, 1800 R.P.M., full load, voltage 4000, complete with switchboard, condensing apparatus and piping.

THE COLUMBUS RY., PR. & LT. COMPANY
14 N. High Street, Columbus, Ohio

WANTED

ROTARY CONVERTERS

1—500-kw. Rotary Converter, 550-600-volt, D.C., 25-cycle, 33,000 primary voltage, with necessary transformers.

1—300-kw., 550-600-volt, D.C., 60-cycle, 22,000 primary.

Joplin & Pittsburg Railway Co.
Pittsburg, Kansas

CAR BARGAINS

OPEN and CLOSED MOTOR and TRAIL

Write for Price and Full Particulars to

ELECTRIC EQUIPMENT Co.
601 Commonwealth Bldg. Phila. Pa.

ANSWERS

addressed to us at 36th St. and 10th Ave., New York; Old Colony Bldg., Chicago; Real Estate Trust Bldg., Philadelphia; or Rialto Bldg., San Francisco, will be forwarded without charge (excepting circulars or similar literature).

FOR SALE

1—Rice & Sargent Cross Compound

ENGINE

complete with condenser, direct connected to 360 kw. General Electric

GENERATOR

Specifications of Engine:
High pressure cylinder 16 in. bore.
Low pressure cylinder 32 in. bore.
Stroke 42 in. Revolutions 120.

Specifications of Generator:
General Electric 360 kw.
525 volts, direct current.
Serial No. 53907, type MP.
Form H., class 8.
Amperes 688.
Volts 500, no load; Volts 525, full load.

This generating is set in first-class condition and ready for immediate shipment. *Will be sold at a very reasonable figure.* Outfit may be seen at our Ansonia plant.

FARREL FOUNDRY & MACHINE CO.
Ansonia, Conn.

SEARCHLIGHT SECTION

POSITIONS WANTED

EXECUTIVE—An able executive now employed as manager of railway and light properties, having an annual gross income of $350,000, would consider a change. Position as manager or superintendent of transportation desired, minimum salary of $3,600 per year. PW-171, Elec. Ry. Journal, Philadelphia.

Same Time

Have the replies to your ad come direct to you

All our offices forward promptly the replies addressed to box numbers—yet this indirect method of receiving letters or telegrams necessarily causes some delay and in these abnormal times even a slight delay may prove serious.

To sign your name and address to your advertisement begets confidence in the reader. You can, however, obviate delay in forwarding replies by signing your ad only with initials (your own or others), care of your home, your office or a post-office box number in your city.

For quick and satisfactory results tell the reader everything that he will want to know.

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27 inches— 2.60 an inch
50 inches— 2.55 an inch

Rates for larger spaces furnished on application.

POSITIONS WANTED

GENERAL auditor or secretary-treasurer; 15 years' experience railroad and street railway accounting. Thoroughly conversant with Interstate Electric Railway Accounting Married; age 40. Send for record and references. PW-172, Elec. Ry. Journal, Chicago.

MASTER mechanic wants position; experienced on city and interurban cars; familiar with G. E. and Westinghouse multiple control. Can maintain equipment at high standard. PW-169, Elec Ry. Journal, Cleveland.

TRANSPORTATION—Can handle your transportation department and get results; 14 years with large street railway; thoroughly familiar with every detail of street railway transportation; best of reference from present employer; age 38. PW-181, Elec. Ry Journal, Philadelphia.

SUPERINTENDENT maintenance of way, or road master, track supervisor, wishes to make change; can give good references. PW-180, Elec. Ry. Journal.

POSITIONS VACANT

ASSISTANT manager for medium sized city and suburban property wanted. P-185, Elec. Ry. Journal, Philadelphia.

ASSISTANT superintendent for 10 miles city and suburban line; state experience and salary expected. P-186, Elec. Ry. Journal, Philadelphia.

EXPERIENCED armature winder wanted; good wages, steady work. Apply to J. R. Anderson, superintendent shops, Chattanooga Railway & Light Co., Chattanooga, Tenn.

FOREMEN wanted—Two experienced track foremen; steady employment; salary, $110 per month. P-182, Elec. Ry. Journal, Philadelphia.

TRACK foreman wanted—Good live man to take charge seventeen miles of track and special work, city and interurban. One who can handle men with results. State wages and give references. P-126, Elec. Ry. Journal, Chicago.

WORKING carbarn foreman for a small electric railway in Massachusetts; new shop and equipment; state experience, salary expected and when ready to report. P-183, Elec. Ry. Journal.

These Pages

receive the attention of electrical railway men everywhere. In every industry—in every form of electric service. Have you any proposition to put before these men? Anything to sell or buy that they may want or have? Whatever your message—

Employment or Business Opportunities Offered or Wanted :: Plants, Properties, or Used Equipment For Sale or Wanted :: Bids Wanted for Furnishing Equipment or Supplies ::

these pages—the "SEARCHLIGHT SECTION" of Electric Railway Journal will place your wants before over 8000 men. TRY THEM!

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors

Advertising, Street Car.
Collier, Inc., Barron G.

Air Rectifiers.
Holden & White, Inc.

Alloys, Steel & Iron. (See also Bearings and Bearing Metals.)
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Automobiles and Buses.
Brill Co., The J. G.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles, Car Wheel.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
National Railway Appliance Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
Electric Service Supplies Co.
International Register Co., The

Batteries, Dry.
Johns-Manville Co., H. W.
Nichols-Lintern Co.

Batteries, Storage.
Electric Storage Battery Co.

Bearings and Bearing Metals.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Kerschner Co., Inc., W. B.
More-Jones Brass & Metal Co.
St. Louis Car Co.
Westinghouse Elec. & M. Co.

Bearings, Center and Roller Side.
Holden & White, Inc.
Stucki Co., A.

Bearings, Oilless, Graphite, Bronze and Wood.
Bound Brook Oil-less B. Co.

Bearings, Roller and Ball.
Gurney Ball-Bearing Co.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail.
Niles-Bement-Pond Co.
Zelnicker Sup. Co., W. A.

Blast Apparatus
Green Fuel Economizer Co.

Blowers
Green Fuel Economizer Co.

Boilers.
Babcock & Wilcox Co.

Boiler Tubes.
National Tube Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
Imperial Brass Mfg. Co.
Ohio Brass Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Lincoln Bonding Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Book Publishers
McGraw-Hill Book Co., Inc.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Etc.)
Hubbard & Co.
Lindsley Bros. Co.
Ohio Brass Co.

Brake Adjusters.
Holden & White, Inc.
Westinghouse Traction Brake Co.

Brake Shoes.
Amer. Brake Shoe & Fdry. Co.
Barbour-Stockwell Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
St. Louis Car Co.

Brackets and Cross Arms
American Bridge Co.
Electric Railway Equipment Co.

Brakes, Brake Systems and Brake Parts.
Allis-Chalmers Mfg. Co
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
National Brake Co.
St. Louis Car Co.
Westinghouse Trac. B. Co.

Bridges and Buildings.
American Bridge Co.

Brooms, Track, Steel or Rattan.
Zelnicker Supply Co., W. A.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.

Brushes, Carbon.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
National Carbon Co., Inc.
United States Graphite Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
United States Graphite Co.

Buckets, Grab.
Beaument Co., R. H.

Bunkers, Coal.
American Bridge Co.
Beaument Co., R. H.

Bus Bar Supports.
Philadelphia Electric Co.

Bushings, Case Hardened & Manganese
Bemis Car Truck Co.

Bushings, Graphite and Wooden.
Bound Brook Oil-less B. Co.

Cables. (See Wires and Cables.)

Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc.—See those headings.)

Car Trimmings. (For Curtains, Registers, Doors, Seats, etc.—See those headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Kuhlman Car Co., G. C.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.
Wason Mfg. Co.

Cars, Section.
Mudge & Co.

Cars, Second Hand.
Electric Equipment Co.

Cars, Self-Propelled.
Electric Storage Battery Co.
General Electric Co.

Castings, Brass, Composition or Copper.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
More-Jones Brass & Metal Co.

Castings, Gray Iron and Steel.
American Bridge Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
St. Louis Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
Amer. Brake Shoe & Fdry. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Electric Service Supplies Co.
Holden & White, Inc.
Kerschner Co., Inc., W. B.
Ohio Brass Co.
Wood Co., Chas. N.

Ceiling, Car.—(See Head Lining.)

Circuit Breakers.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Clamps and Connectors for Wires and Cables.
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Hubbard & Co.
Klein & Sons Mathias.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

Cleaners and Scrapers Track.—(See also Snow-Plows, Sweepers and Brooms.)
Brill Co., The J. G.
Ohio Brass Co.

Clusters and Sockets.
General Electric Co.

Coal and Ash Handling.—(See Conveying and Hoisting Machinery.)

Coil Banding and Winding Machines.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Coils, Armature and Field.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Coils, Choke and Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
International Register Co., The
Johnson Fare Box Co.

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.
Wood Co., Chas. N.

Commutator Truing Devices.
General Electric Co.

Commutators or Parts.
Cameron Electrical Mfg. Co.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Compressors, Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Trac. B. Co.

Concrete Mixers.
Jaeger Machine Co.

Condensers
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Conduit Fittings.
V. V. Fittings Co.

Connectors, Solderless.
Westinghouse Elec. & Mfg. Co.

Controller Regulators.
Electric Service Supplies Co.

Controllers or Parts.
Allis-Chalmers Mfg. Co.
Columbia M. W. & M. I. Co.
General Electric Co.
Kerschner Co., Inc., W. B.
Westinghouse Elec. & Mfg. Co.

Controlling Systems.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Converters, Rotary.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Conveying and Hoisting Machinery.
American Bridge Co.
Columbia M. W. & M. I. Co.
Green Engrg. Co.

Cord, Bell, Trolley, Register, etc.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The
Samson Cordage Works

Cord Connectors and Couplers.
Electric Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car.
Brill Co., The J. G.
Ohio Brass Co.
Van Dorn Coupler Co.
Westinghouse Trac. B. Co.

Cranes. (See also Hoists.)
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.

Creosoting. (See Wood Preservatives.)

Cross Arms. (See Brackets.)

Crossing Foundations.
Balkwill Manganese Crossing Co
International Steel Tie Co.

Crossing Signals. (See Signals, Crossing.)

Crossings, Track. (See Track, Special Work.)

Crushers, Rock.
Allis-Chalmers Mfg. Co.

Culverts
Canton Culvert & Silo Co.

Curtains and Curtain Fixtures.
Brill Co., The J. G.
Electric Service Supplies Co.
Hartshorn Company, Stewart
St. Louis Car Co.

Study the Instrument Question



BUY W.S.S.

Model 341

A. C. and D. C. Voltmeter

One of the Portable Electrodynamometer Group, which also includes Model 310 Single Phase and D. C. Wattmeter, Model 329 Polyphase Wattmeter, and Model 370 A. C. and D. C. Ammeter.

The characteristics of the group are extreme accuracy (guaranteed within a fraction of 1% full scale value), adaptability for use on circuits of any commercial frequency and any wave form, great overload capacity, low moment of inertia, effective damping and shielding, and the legibility and remarkable uniformity of the hand calibrated scales.

Only when you have studied it by direct comparisons will you realize fully what a high degree of efficiency and economy you can effect by selecting

Weston

Indicating Instruments

As soon as you inspect them—even before you subject them to the test of comparisons in actual use—the reasons for their acknowledged superiority will be apparent to you. These reasons are revealed in every structural detail.

Weston Indicating Instruments include a great variety of groups for portable or switchboard service on A. C. or D. C. Circuits. Instruments designed expressly for testing and laboratory use, for motor car and boat electrical systems, and many others for special purposes. Write for Bulletins or Catalogs describing those which interest you.

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New York, Philadelphia, Pittsburgh, Cleveland, Cincinnati, Chicago, Boston, Buffalo, Richmond, San Francisco, Florence, Denver, Detroit, St. Louis, Toronto, Winnipeg, Johannesburg, S. Africa, Montreal, Vancouver, London, Paris, Petrograd

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50 East 42d St., NEW YORK CITY

Hegeman-Castle Corporation Chicago
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Selling Agents for Tool Steel Gears and Pinions, Johnson Fare Boxes, Perry Side Bearings, Hartman Centering Center Plates, Wasson Trolley Bases, Rimco Rubber Insulated Pliers, Garland Ventilators, Electric Arc Welders, High Class Railway Varnishes and Enamels, Axles and Forgings.

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MORGANITE

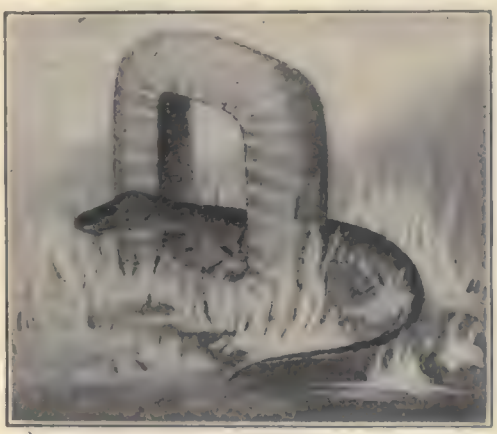
- THE BRUSH

Are you getting the "Dustoor Hai" Book as issued ?



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Main Office and Factory: 519 West 38th St., New York City. DISTRICT AGENTS: Lewis & Roth, Philadelphia. Electrical Engineering & Mfg. Co., Pittsburgh. W. L. Rose Equipment Co., St. Louis, Mo. Herzog Electric & Engineering Co., San Francisco, Cal. W. R. Hendrey Co., Seattle, Wash. Charles Farnham, Los Angeles, Cal.



Get those coils back into service—quick!

Don't let LABOR SHORTAGE hold them up in your coil department. You can't get more men—but you can save time and money by sending the coils to us for re-insulation with

SALAMANDER Pure Asbestos

We will return them promptly—better insulated and more durable than when new.

"Salamander" asbestos wire excels in insulating value and cannot burn out under the severest overload. Leading electric railways are our best customers. Write us for details now.

Independent Lamp & Wire Co., Inc.

OFFICES: 1737 Broadway, New York

FACTORIES: York, Pa., and Weehawken, N. J.

WHAT AND WHERE TO BUY

Cutting Apparatus, Oxy-Acetylene.
Imperial Brass Mfg. Co.
Milburn Co., The Alex.

Derailing Devices. (See also Track Work.)
Cleveland Frog & Crossing Co.
Reading Specialties Co.

Destination Signs.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Detective Service.
Wisch Service, P. Edward

Door Operating Devices.
Consolidated Car Heating Co.
National Pneumatic Co.

Doors and Door Fixtures.
Brill Co., The J. G.
General Electric Co.
Hale & Kilburn Co.

Doors, Folding Vestibule.
National Pneumatic Co.

Draft Rigging. (See Couplers.)

Drills, Track.
American Steel & Wire Co.
Electric Service Supplies Co.
Niles-Bement-Pond Co.
Ohio Brass Co.

Dryers, Sand.
Electric Service Supplies Co.
Zelnicker Sup. Co., W. A.

Economizers, Fuel.
Green Fuel Economizer Co.

Electrical Wires and Cables
Roebling's Sons Co., J. A.

Engineers, Consulting, Contracting and Operating.
Archbold-Brady Co.
Arnold Co., The.
Beeler, John A.
Byllesby & Co., Inc., H. M.
Drum & Co., A. L.
Ford, Bacon & Davis.
Pugh, S. D.
Richey, Albert S.
Sanderson & Porter.
Scofield Engineering Co.
Sloan, Huddle, Feustel & Freeman
Stone & Webster.
White Companies, The J. G.
Woodmansee & Davidson Engineering Co.

Engines, Gas and Oil.
Allis-Chalmers Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Engines, Steam.
Allis-Chalmers Mfg. Co.
Green Fuel Economizer Co.
Westinghouse Elec. & Mfg. Co.

Excavators.
General Eng. & Constr. Co.

Fans.
Green Fuel Economizer Co.

Fare Boxes.
Brill Co., The J. G.
Cleveland Fare Box Co.
International Register Co., The.
Johnson Fare Box Co.
National Railway Appliance Co.

Fences, Woven Wire and Fence Posts.
American Steel & Wire Co.
Page Steel & Wire Co.
Standard Steel Mould Co.

Fenders and Wheel Guards.
Brill Co., The J. G.
Cleveland Fare Box Co.
Consolidated Car Fender Co.
Electric Service Supplies Co.
Star Brass Works.

Fibre and Fibre Tubing.
Westinghouse Elec. & Mfg. Co.

Field Coils (See Coils.)

Filters, Water.
Scaife & Sons Co., Wm. B.

Floodlights.
Electric Service Supplies Co.

Flooring Composition.
American Mason Safety Tread Co.

Forgings.
Eureka Co.
Standard Steel Works Co.

Frogs, Track. (See Track Work.)

Fuel Economizers.
Green Fuel Economizer Co.

Furnaces. (See Stokers.)

Fuses and Fuse Boxes.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
Daum, A. F.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Fuses, Refillable.
Columbia M. W. & M. I. Co.
General Electric Co.

Gaskets.
Power Specialty Co.
Westinghouse Traction Brake Co.

Gas Producers.
Westinghouse Elec. & Mfg. Co.

Gates, Car.
Brill Co., The J. G.

Gages, Oil and Water.
Ohio Brass Co.

Gear Blanks.
Carnegie Steel Co.
Standard Steel Works Co.

Gear Cases.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Kerschner Co., Inc., W. R.
Thayer & Co., Inc.
Westinghouse Elec. & Mfg. Co.

Gears and Pinions.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Kerschner Co., Inc., W. R.
National Railway Appliance Co.
Nuttall Co., R. D.
Tool Steel Gear & Pinion Co.

Gears, Reduction.
Green Fuel Economizer Co.

Generating Sets, Gas-Electric.
General Electric Co.

Generators.
Allis-Chalmers Mfg. Co.
General Electric Co.
Lincoln Electric Co.
Westinghouse Elec. & Mfg. Co.

Gongs. (See Bells and Gongs.)

Graphite.
Morgan Crucible Co.

Greases. (See Lubricants.)

Grinders and Grinding Supplies.
Indianapolis Switch & Frog Co.
Railway Track-work Co.

Grinding Blocks and Wheels
Norton Co.
Railway Track-work Co.

Guards, Cattle.
American Bridge Co.

Guards, Trolley.
Electric Service Supplies Co.
Ohio Brass Co.

Harps, Trolley.
Anderson M. Co., A. & J. M.
Bayonet Trolley Harp Co.
Electric Service Supplies Co.
More-Jones B. & M. Co.
Nuttall Co., R. D.
Star Brass Works.

Headlights.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
St. Louis Car Co.

Heaters, Car (Electric.)
Consolidated Car Heating Co.
Gold Car Heating & Lighting Co.
Smith Heater Co., Peter.

Heaters, Car, Hot Air and Water.
Cooper Heater Co.
Smith Heater Co., Peter.

Heaters, Car (Stove.)
Electric Service Supplies Co.
Smith Heater Co., Peter.

Hoists and Lifts.
Columbia M. W. & M. I. Co.
Duff Mfg. Co.
Ford Chain Block & Mfg. Co.
Niles-Bement-Pond Co.

Hose, Bridges.
Ohio Brass Co.

Hose, Pneumatic and Fire.
Westinghouse Traction Brake Co.

Hydraulic Machinery.
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.

Inspection.
Electrical Testing Lab's.

Instruments, Measuring, Testing and Recording.
Economy Electric Devices Co.
General Electric Co.
Westinghouse Elec. & M. Co.
Weston Elec'l Instrument Co.

Insulating Cloth, Paper and Tape.
Freydberg Bros., Inc.
General Electric Co.
Irvington Varnish & Insulator Co.
Mitchell-Rand Mfg. Co.
Standard Paint Co.
Standard Underground Cable Co.
Standard Woven Fabric Co.
U. S. Rubber Co.
Westinghouse Elec. & M. Co.

Insulation. (See also Paints.)
Anderson M. Co., A. & J. M.
Drew Electric & Mfg. Co.
Electric Service Supplies Co.
General Electric Co.
Holden & White, Inc.
Mitchell-Rand Mfg. Co.
U. S. Rubber Co.
Westinghouse Elec. & M. Co.

Insulators. (See also Line Material.)
Anderson M. Co., A. & J. M.
Electric Railway Equipment Co.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Insulator Pins.
Electric Service Supplies Co.
Hubbard & Co.

Jacks. (See also Cranes, Hoists and Lifts.)
Brill Co., The J. G.
Buckeye Jack Mfg. Co.
Columbia M. W. & M. I. Co.
Duff Manufacturing Co.
National Ry. Appliance Co.
Templeton, Kenly Co., Ltd.

Joints, Rail.
Carnegie Steel Co.
Lackawanna Steel Co.
Reading Specialties Co.
Zelnicker Sup. Co., W. A.

Journal Boxes.
Bemis Car Truck Co.
Brill Co., The J. G.

Junction Boxes.
Standard Underground Cable Co.

Laboratory.
Electrical Testing Lab's.

Lamp Guards and Fixtures.
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Lamps, Arc and Incandescent. (See also Headlights.)
Anderson M. Co., A. & J. M.
General Electric Co.
Westinghouse Elec. & M. Co.

Lamps, Signal and Marker.
Nichols-Lintern Co.
Ohio Brass Co.

Lathes, Car Wheel.
Niles-Bement-Pond Co.

Lighting Regulators, Car.
Holden & White, Inc.

Lightning Protection.
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Lights, Portable Carbide.
Milburn Co., The Alex.

Line Material. (See also Brackets, Insulators, Wires, etc.)
Anderson M. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Drew Electric & Mfg. Co.
Electric Railway Equipment Co.
Electric Service Supplies Co.
Eureka Co.
General Electric Co.
Holden & White, Inc.
Hubbard & Co.
Johns-Manville Co., H. W.
More-Jones B. & M. Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Locomotives, Electric.
Brill Co., The J. G.
General Electric Co.
McGuire-Cummings Mfg. Co.
Westinghouse Elec. & M. Co.

Lubricating Engineers.
Galena-Signal Oil Co.

Lubricants, Oil and Grease.
Galena-Signal Oil Co.

Lumber. (See Poles, Ties, etc.)

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Columbia M. W. & M. I. Co.
Niles-Bement-Pond Co.

Machine Work.
Columbia M. W. & M. I. Co.
Holden & White, Inc.

Meters, Car, Watt-Hour.
Economy Electric Devices Co.

Meters. (See Instruments.)
Electric Service Supplies Co.
Wood Co., Chas N.

Mica.
Schoonmaker, A. O.

Mirrors for Motormen.
Drew Elec. & Mfg. Co.

Motors, Electric.
Allis-Chalmers Mfg. Co.
Lincoln Electric Co.
Westinghouse Elec. & M. Co.

Motor Generation, Bonding and Welding.
Lincoln Bonding Co.

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Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Hubbard & Co
Lackawanna Steel Co.

Oils. (See Lubricants.)

Oxy-Acetylene. (See Cutting Apparatus, Oxy-Acetylene.)

Packing.
Power Specialty Co.
U. S. Rubber Co.
Westinghouse Traction Brake Co.

Paints and Varnishes. (Insulating.)
Irvington Varnish & Insulator Co.
Mitchell-Rand Mfg. Co.
Standard Paint Co.

Paints and Varnishes. (Preservative.)
Standard Paint Co.

Paints and Varnishes for Woodwork.
National Ry. Appliance Co.

Paving Brick, Filler and Stretcher.
Nelsonville Brick Co.


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Oakland


Boston


Chicago


Newark

Would You Like To Double Your Track Maintenance Force?

Here are a lot of traction companies who have had the experience of about doubling the work-producing capacity of a small gang of workmen, by equipping them with

"Imperial" Tie Tampers

These pneumatic tools serve a twofold purpose. They tamp ballast—the kind of material cuts no figure—rapidly, firmly and much faster than a 50% larger gang of men working by hand. Their other use is in the removal of pavement—concrete, asphalt, block, paving brick—for which service they are fitted with special picks and cutting tools. The relative increase in rate of progress is equal to that in tamping.

The tampers operate from a portable electrically driven compressor which is often called on to supply power to pneumatic rail drills, spike driving hammers, portable grinders, riveting hammers and like tools. Once installed pneumatic equipment is soon an indispensable means of doing mechanically various jobs that had been slow and costly with hand methods.

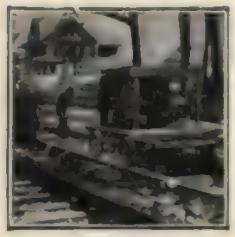
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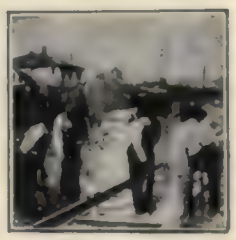
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Nelsonville Brick Co.

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Electric Service Supplies Co.
Ohio Brass Co.

Pinion Pullers.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
Wood Co., Chas. N.

Pinions. (See Gears.)

Pins, Case Hardened, Wood and Iron.
Bemis Car Truck Co.
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse Traction Brake Co.

Pipe.
National Tube Co.

Pipe Fittings.
Power Specialty Co.
Standard Steel Works Co.
Westinghouse Traction Brake Co.

Planers. (See Machine Tools.)

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Electric Service Supplies Co.
National Railway Appliance Co.

Pole Reinforcing.
Hubbard & Co.

Pole Sleeves.
Drew Electric & Mfg. Co.

Poles and Ties, Treated.
Lindsley Bros. Co.

Poles, Metal Street.
Electric Railway Equipment Co.
Hubbard & Co.

Pole Sleeves.
Drew Elec. & Mfg. Co.

Poles, Ties, Posts, Piling and Lumber.
Carney & Co., B. J.
Lindsley Bros. Co.
Northern White Cedar Assn.
Southern Cypress Mfg. Assn.
White Marble Lime Co.

Poles, Trolley.
Anderson M. Co., A. & J. M.
Bayonet Trolley Harp Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
National Tube Co.
Nuttall Co., R. D.

Poles, Tubular Steel.
National Tube Co.

Power Saving Devices.
Arthur Power-Saving Recorder Co.
Railway Improvement Co.

Pressure Regulators.
General Electric Co.
Ohio Brass Co.
Westinghouse Electric & Mfg. Co.

Pumps.
Allis-Chalmers Mfg. Co.

Punches, Ticket.
Bonney-Vehslage Tool Co.
International Register Co., The
Wood Co., Chas. N.

Purifiers, Feed Water
Scaife & Sons Co., Wm. B.

Rail Grinders. (See Grinders.)

Rail Welding. (See Brazing and Welding Processes.)

Rails, Relaying.
Zelnicker Supply Co., W. A.

Rattan.
Brill Co., The J. G.
Electric Service Supplies Co.
Hale & Kilburn Co.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.

Recorders, Power Saving.
Arthur Power-Saving Recorder Co

Registers and Fittings.
Bonham Recorder Co.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The
Rooke Automatic Register Co.
Standard Register Co.

Reinforcement, Concrete.
American Steel & Wire Co.

Repair Shop Appliances. (See also Coil Banding and Winding Machines.)
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Repair Work. (See also Coils.)
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Replacers, Car.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Reading Specialties Co.

Resistance, Grid.
Columbia M. W. & M. I. Co.
Ellcon Co.

Resistance, Wire and Tube.
General Electric Co.
Westinghouse Elec. & M. Co.

Retrievers, Trolley. (See Catchers and Retrievers, Trolley.)

Rheostats.
Ellcon Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Roofing, Building.
Standard Paint Co.

Rubber Specialties of all Kinds.
U. S. Rubber Co.

Sanders, Track.
Brill Co., The J. G.
Cleveland Fare Box Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Holden & White, Inc.
Nichols-Lintern Co.
Ohio Brass Co.
St. Louis Car Co.

Sash Fixtures, Car.
Brill Co., The J. G.

Sash Metal, Car Window.
Hale & Kilburn Co.

Scrapers, Track. (See Cleaners and Scrapers, Track.)

Seats, Car.
Brill Co., The J. G.
Hale & Kilburn Co.
St. Louis Car Co.

Second-Hand Equipment. (See Searchlight Section)
Archer & Baldwin.
Kerschner Co., Inc., W. B.
MacGovern & Co., Inc.

Shade Rollers.
Hartshorn Co., Stewart

Shades, Vestibule.
Brill Co., The J. G.

Shovels.
Hubbard & Co.

Shovels, Power.
Allis-Chalmers Mfg. Co.

Signal Systems, Block.
Electric Service Supplies Co.
Federal Signal Co.
Nachod Signal Co., Inc.
U. S. Electric Signal Co.
Wood Co., Chas. N.

Signals, Car Marker
Nichols-Lintern Co.

Signals, Car Starting.
Consolidated Car Heating Co.
Electric Service Supplies Co.
National Pneumatic Co.

Signal Systems, Highway Crossing.
Nachod Signal Co., Inc.
U. S. Electric Signal Co.

Slack Adjusters. (See Brake Adjusters.)

Sleet Wheels and Cutters.
Anderson Mfg. Co., A. & J. M.
Bayonet Trolley Harp Co.
Columbia M. W. & M. I. Co.
Drew Electric & Mfg. Co.
Holden & White, Inc.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.

Snow-Plows, Sweepers and Brooms.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Consolidated Car Fender Co.
McGuire-Cummings Mfg. Co.

Solderless Connectors.
Westinghouse Elec. & Mfg. Co

Soldering and Brazing Apparatus. (See Welding, Processes and Apparatus.)

Spikes.
American Steel & Wire Co.
Lackawanna Steel Co.

Splicing Compounds
Standard Woven Fabric Co.
U. S. Rubber Co.
Westinghouse Elec. & Mfg. Co.

Splicing Sleeves. (See Clamps and Connectors.)

Springs, Car & Truck.
American Steel & Wire Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Standard Steel Works Co.
Union Spring & Mfg. Co.

Sprinklers, Track & Road.
Brill Co., The J. G.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.

Steps, Car.
American Mason S. T. Co.
Universal Safety Tread Co.

Stokers, Mechanical.
Babcock & Wilcox Co.
Green Engrg. Co.
Westinghouse Elec. & M. Co.

Storage Batteries. (See Batteries, Storage.)

Strand
Roebling Son's Co., J. A.

Straps, Car, Sanitary.
Holden & White, Inc.

Structural Iron. (See Bridges.)

Superheaters.
Babcock & Wilcox Co.
Power Specialty Co.

Sweepers, Snow. (See Snow Plows, Sweepers & Brooms.)

Switch Stands.
Indianapolis Switch & Frog Co.
Kilby Frog & Switch Co.
Ramapo Iron Works.

Switches, Safety.
V. V. Fittings Co.

Switches, Track. (See Track, Special Work.)

Switches & Switchboards.
Allis-Chalmers Mfg. Co.
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Nichols-Lintern Co.
Westinghouse Elec. & M. Co.

Tanks, Oil Storage.
Milwaukee Tank Works.

Tampers, Tie.
Ingersoll-Rand Co.

Tapes and Cloths. (See Insulating Cloths, Paper and Tape.)

Telephones and Parts.
Electric Service Supplies Co.

Termnals Cables.
Standard Underground Cable Co.

Testing Commercial & Electrical.
Elec'l Testing Laboratories.

Testing Instruments. (See Instruments, Electrical Measuring, Testing, etc.)

Thermostats.
Consolidated Car Heating Co.
Gold Car Heating & Lighting Co.
Railway Utility Co.
Smith Heater Co., Peter.

Ticket Choppers & Destroyers.
Electric Service Supplies Co.

Ties, Mechanical.
Dayton Mechanical Tie Co.

Ties and Tie Rods, Steel.
American Bridge Co.
Barbour-Stockwell Co.
Carnegie Steel Co.
International Steel Tie Co.

Ties, Wood Cross. (See Poles, Ties, Posts,, etc.)

Tools, Track & Miscellaneous.
American Steel & Wire Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Hubbard & Co.
Klein & Sons, Mathias.
Railway Track-work Co.

Torches, Acetylene. (See Cutting Apparatus.)

Tower-Wagons and Auto-Trucks.
McCardell & Co., J. R.

Towers & Transmission Structures.
American Bridge Co.
Archbold-Brady Co.
Westinghouse Elec. & M. Co.

Track, Special Work.
Barbour-Stockwell Co.
Cleveland Frog & Cross. Co.
Columbia M. W. & M. I. Co.
Indianapolis Switch & Frog Co.
Kilby Frog & Switch Co.
New York Switch & Crossing Co.
Ramapo Iron Works.

Transfers. (See Tickets.)

Transfer Tables.
American Bridge Co.
Archbold-Brady Co.

Transformers.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Treads, Safety, Stairs, Car Steps.
American Mason S. T. Co.
Universal Safety Tread Co.

Trolley Bases.
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Holden & White, Inc.
More-Jones Brass & Metal Co.
National Railway Appliance Co.
Nuttall Co., R. D.
Ohio Brass Co.

Trolley Bases, Retrieving.
Holden & White, Inc.

Trolleys & Trolley Systems.
Ford Chain Block & Mfg. Co.

Trolley Shoes.
Holden & White, Inc.

Trolley Wheels. (See Wheels, Trolley.)

Trolley Wire
Roebling Son's Co., John A.

Trucks, Car.
Bemis Car Truck Co.
Brill Co., The J. G.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.



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AMONG the various bases on the market, the one distinctly a city service base is the Nuttall No. 15. Being a ball bearing base it embodies the following features:

1.—Equalizes the swaying movement of the car.
2.—Has adjustable wheel pressure.
3.—Operates smoothly on curves and switches.
4.—Weighs but 75 lbs.

(Another valuable feature is its successful application to Quick Service operation.)

NUTTALL PITTSBURGH

"The Quality Shops"
CARS TRUCKS

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Back of every successful organization lies the rugged honesty of its founders.

That the makers of St. Louis Cars have never lost sight of this fact is evidenced by the enviable reputation they have achieved throughout the railway world.

We are justly proud of our organization and of our army of intelligent-conscientious workman who are directly responsible for our reputation.

To assist in solving your car problems, we offer, without charge or obligation, the services of our efficiency engineers.

St. Louis Car Company
St. Louis, Mo.

Union Springs

solve the problem of eliminating shocks at high speed with medium-weight cars

Consult Us.



We may be able to help you reduce your car weights.

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Standard Pattern Shoe
One standard driver shoe
One standard car shoe
And there you are—

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30 Church St., New York
McCormick Bldg., Chicago Chattanooga, Tenn.

Tubing, Steel.
National Tube Co.

Turbines, Steam.
Allis-Chalmers Mfg. Co.
General Electric Co.
Green Fuel Economizer Co.
Westinghouse Elec. & M. Co.

Turbines, Water.
Allis-Chalmers Mfg. Co.

Turnstiles.
Perey Mfg. Co., Inc.

Vacuum Impregnation.
Allis-Chalmers Mfg. Co.

Valves.
Ohio Brass Co.
Westinghouse Traction Brake Co.

Varnishes. (See Paints, etc.)

Ventilators, Car.
Brill Co., The J. G.
Holden & White, Inc.
National Railway Appliance Co.
Nichols-Lintern Co.
Railway Utility Co.
St. Louis Car Co.

Voltmeters. (See Instruments.)

WHAT AND WHERE TO BUY

Washers.
Bound Brook Oil-less B. Co.

Waste Saturation Systems
Milwaukee Tank Works.

Water Softening and Purifying Systems.
Scaife & Sons Co., Wm. B.

Welders, Electric Arc.
Lincoln Electric Co.

Welders, Portable Electric.
Electric Ry. Improvement Co.
Indianapolis Switch & Frog Co.

Welding Processes and Apparatus.
Electric Ry. Improvement Co.
General Electric Co.
Imperial Brass Mfg. Co.
Lincoln Electric Co.
National Ry. Appliance Co.
Westinghouse Elec. & M. Co.

Wheel Guards. (See Fenders & Wheel Guards.

Wheel Presses. (See Machine Tools.)

Wheels, Car, Cast Iron.
Bemis Car Truck Co.

Wheels, Car, Steel and Steel Tired.
Bemis Car Truck Co.
Carnegie Steel Co.
Standard Steel Works Co.

Wheels, Trolley.
Anderson Mfg. Co., A. & J. M.
Bayonet Trolley Harp Co.
Bound Brook Oil-less B. Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Eureka Co.
General Electric Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
More-Jones B. & M. Co.
Nuttall Co., R. D.
Star Brass Works.

Whistles, Air.
General Electric Co.
Ohio Brass Co.
Westinghouse Traction Brake Co.

Wire Rope.
American Steel & Wire Co.
Roebling's Sons Co., John A.

Wires and Cables.
Aluminum Co. of America.
American Elec'l Works
American Steel & Wire Co.
Bridgeport Brass Co.
D & W Fuse Co.
General Electric Co.
Roebling's Sons Co., John A.
Standard Underground Cable Co.
Westinghouse Elec. & M. Co.

Wood Preservatives.
Lindsley Bros. Co.
Republic Creosoting Co.

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Titanium Rail for Curved Track at Brookline, Mass.

The grinding, uneven wear at curves soon finds out the many weak spots in the ordinary rail.

First comes a period of screechy, disagreeable operation; then the premature, costly renewal.

TITANIUM TREATMENT

Defers Your Rail Renewals

at a cost per ton which is amazingly low in comparison with the benefits derived—such as doubling the life of the rail and cutting paving rehabilitation charges in half.

The use of Titanium-treated rails by Boston, Philadelphia, Brooklyn, Pittsburgh, St. Louis, Los Angeles, San Francisco and other cities surely warrants your attention.

TITANIUM ALLOY MANUFACTURING COMPANY

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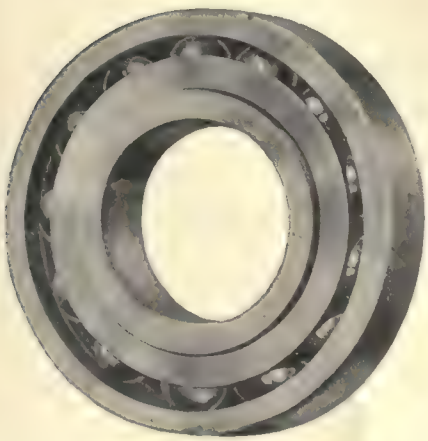
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AGENTS:

Pacific Coast: ECCLES & SMITH CO., Los Angeles, San Francisco, Portland
Great Britain and Europe: T. ROWLANDS & CO., Sheffield, England



In the largest City using the Safety Car



At Seattle

Twenty-five Safety Cars are now in service in Seattle, the largest city that has so far successfully used this type of car.

At Seattle, as in the eighteen other cities, where GURNEY-Equipped Safety Cars are used, GURNEY BALL BEARINGS save power and reduce maintenance costs.

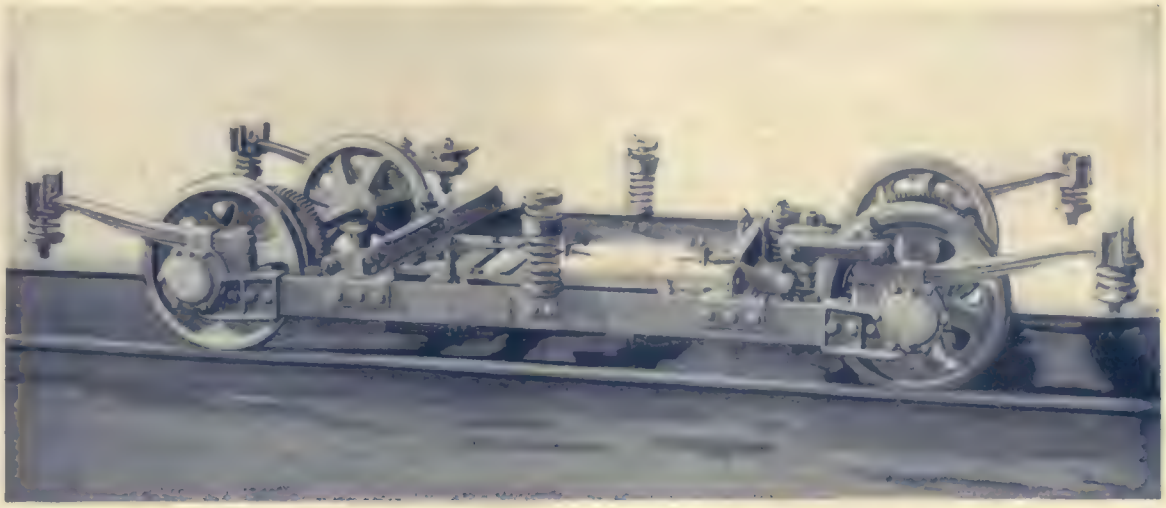
Gurney Ball Bearing Company

Conrad Patent Licensee

Jamestown, N. Y.

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The Standard Truck for Safety Cars



IF you have ever ridden on a Brill 78-M Truck you don't need to be told that it is the smoothest and steadiest running truck ever put under a four-wheel car. The easy spring motion that made you forget you were sitting on a springless seat (practically all Safety Cars have springless seats) is the result of directly combining the action of quarter-elliptics and spirals, and flexibly connecting them to the car body. A simple arrangement, never before used in truck construction. And it provides the long spring base that holds the car steady and free from any bounding or teetering effect even when running at maximum speed. Write for a copy of the newly published Bulletin 234.

J. G. BRILL COMPANY
PHILADELPHIA, PA.

G. C. KUHLMAN CAR CO.
CLEVELAND, OHIO

BRILL

AMERICAN CAR COMPANY
ST. LOUIS, MO.

WASON MANUFACTURING CO.
SPRINGFIELD, MASS.

The K-63 Controller

Less Work for the Motorman—More Room for the Passenger

The K-63 Controller is another marvelous advance in the production of light-weight, compact equipment. Although two of these controllers weigh only 270 pounds, they will handle equipments up to two 40-hp. motors on 600 volts, thus giving a large factor of safety when operating two 25-hp. motors on a light-weight car.

This controller with its light-weight cylinder and smaller fingers is more easily manipulated than the controllers hitherto used on city cars, thus relieving the operator of an appreciable amount of fatigue.

Then, too, the addition to fare handling equipment on the front platform makes compactness exceptionally desirable, thereby securing a high rate of passenger interchange without jostling or possible injury to patrons.

So the K-63 is doubly desirable since its installation will please both the car operator and the car user.

25-3



General Electric Company

General Offices:

Sales Offices

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Company, Inc. June 22, 1918

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Deliver The Goods

"Joe," said the General Manager, "did you read the statements in the Westinghouse advertising pages of the 'Electric Railway Journal' on May 11th? The government expects every railway in the country to do its part. The questions we must answer are:—Are we delivering our share of the goods, and have we conferred with the various Boards of Trade and Merchants' Associations in the communities which we serve? We ought to do this at once, as we need additional facilities and their cooperation. According to the Westinghouse 'ad', they are prepared to furnish locomotive and freight motor equipments."

"You're right, Boss," replied Joe, "a couple of Westinghouse 50-ton locomotives would take care of all the freight between the various localities along our lines. If we can get the business men of each town to cooperate with us, we can build up a good business and give them service that they can secure in no other way."

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pennsylvania

WESTINGHOUSE ELECTRIC

Vol. 51, No. 25 New York, June 22, 1918 Pages 1177 to 1218

Electric Railway Journal

H. W. BLAKE, *Editor*

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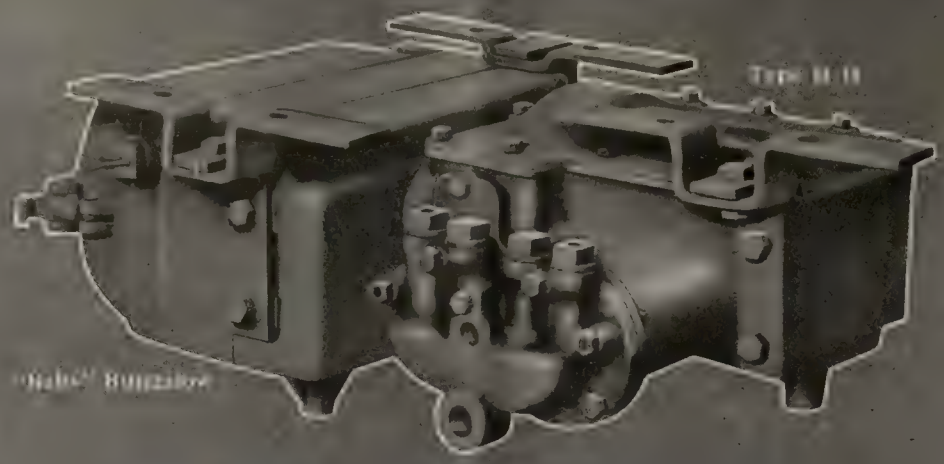
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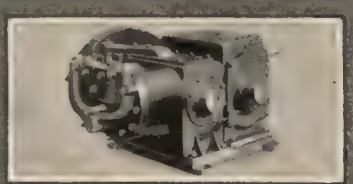
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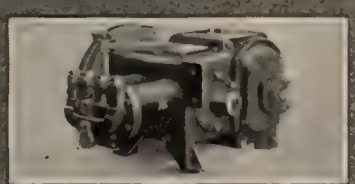
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Air Compressors





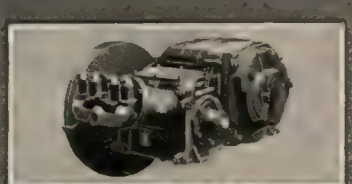
Westinghouse Air Compressors cover a broad field of service. Meet all operating conditions. Can be fitted to any current. Capacities range from 10 to 150 cubic feet per minute. Write to our nearest office.











Brake Building our Business for a Lifetime

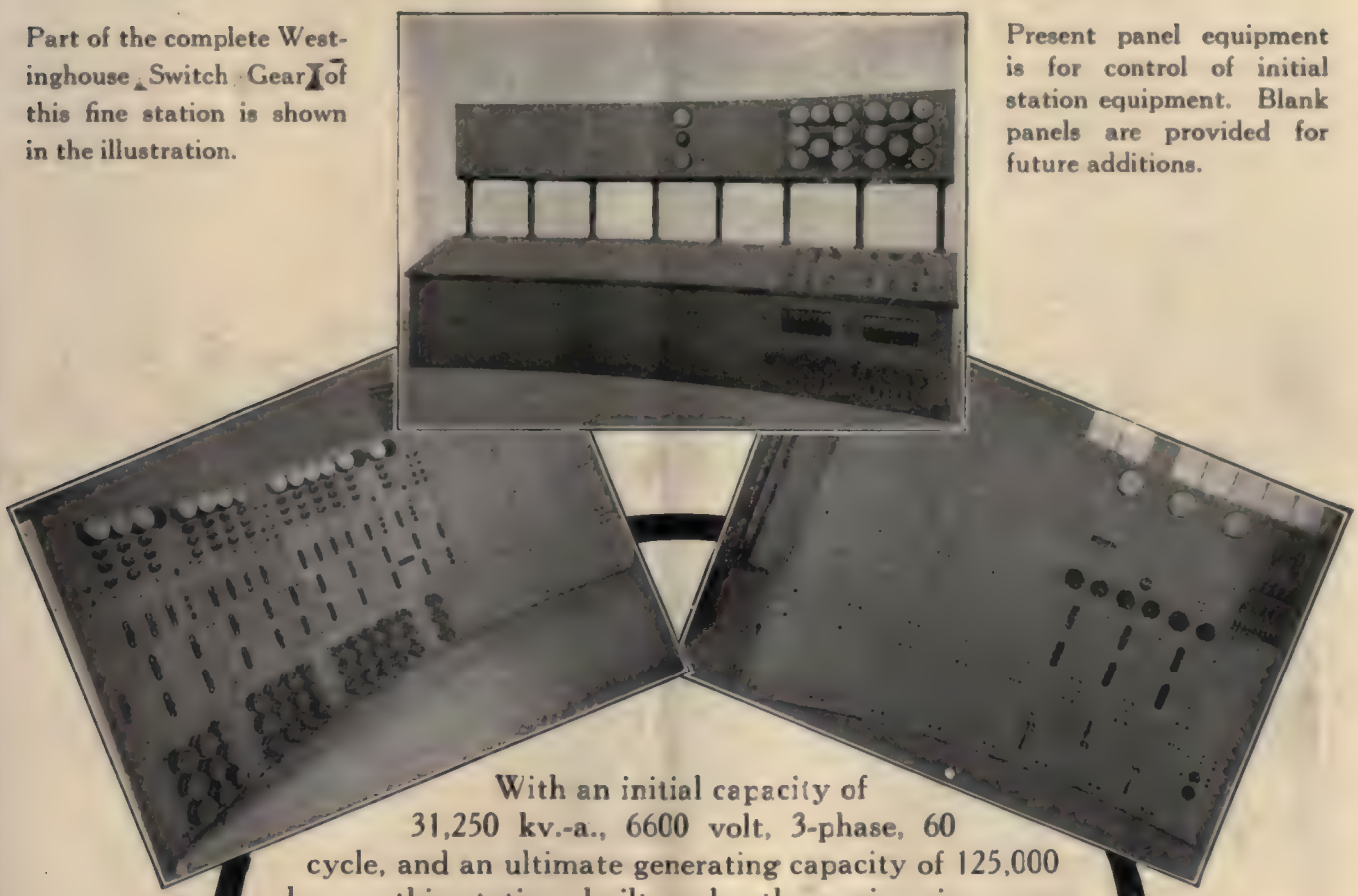
Westinghouse Traction Brake Company

General Offices and Works, Wilmerding, Pa.

Atlanta, Ga.
Boston, Mass.
Chicago, Ill.
Columbus, O.
Denver, Col.
Houston, Tex.
Los Angeles, Cal.
Mexico City
New York, N. Y.
Pittsburgh, Pa.
San Francisco
Seattle, Wash.
St. Louis, Mo.
St. Paul, Minn.

Switchboard Equipment Of The Dayton Power & Light Co's. New Miller's Ford Generating Station

Part of the complete Westinghouse Switch Gear of this fine station is shown in the illustration.



Present panel equipment is for control of initial station equipment. Blank panels are provided for future additions.

With an initial capacity of 31,250 kv.-a., 6600 volt, 3-phase, 60 cycle, and an ultimate generating capacity of 125,000 kv.-a., this station, built under the engineering supervision of Thos. E. Murray, Consulting Engineer, is an excellent example of modern switch gear.

Included are a seven-section, curved generator control desk; a ten-panel, curved feeder board (shown to left); an eight-panel, curved exciter and voltage regulator board (shown to right); a three-panel meter and battery board; and six 2000-ampere, Type O-2; thirteen 600-ampere, Type E-6; sixteen 1200-ampere Type E-8 Oil Circuit Breakers; all solenoid operated.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa. 12

Sales Offices in all Large American Cities

W WESTINGHOUSE ELECTRIC

Westinghouse

Phono-Electric belongs at All Busy Centers



Seattle uses No. 00 round Phono-Electric Trolley Wire at many curves, both in the heavy and normal traffic lines.

The one pictured is at Fourth Avenue and Main Street, where it has insured continuous energy supply

to 500 cars a day since February, 1911

Not only is the Phono-Electric wire still up —it has never been down!

Bridgeport Brass Company
Bridgeport Connecticut

2063

O-B PRODUCTS



O-B Form I Trolley Base—Patented

O-B Trolley Bases
Are Completely Interchangeable

Every Master Mechanic realizes the desirability—and the scarcity—of devices which have absolutely interchangeable parts.

All the parts of the O-B Base are machined on jigs to fit a master model. Take a dozen assembled O-B Bases—from regular stock—disassemble them; mix the parts thoroughly and they will invariably go together again without a hitch.

O-B Bases excel in many ways. There are renewable bushings at points of greatest wear—at small expense Base is made practically new.

The Base has uniform pressure of trolley wire at all heights; swings freely on roller bearings; has excess current-carrying capacity; is easily accessible for inspection of all parts.

Shall we put an O-B Base on one of your cars for trial at our expense?



Dark Portions Are Renewable Bushings

The Ohio Brass Company, Mansfield, Ohio

New York Philadelphia Pittsburgh Chicago Los Angeles San Francisco

DREW PRODUCTS STAND THE TEST



Photograph of a Drew Clinch Ear, twisted two and one-half turns on each end with a monkey wrench, without a flaw or fracture.

Drew Clinch Ears, Frogs, Crossings, Splicers and Splicing Ears have an unbroken record for reliable service.

It is not a question of experiment with Drew Line Material—the experimental stage has been passed.

Drew Line Material has been standardized on many of the largest properties in the United States.

Look into this subject and arrange to get the benefit of "DREW ECONOMY"—it means a saving of dollars and cents and better service on your road from the day you start.

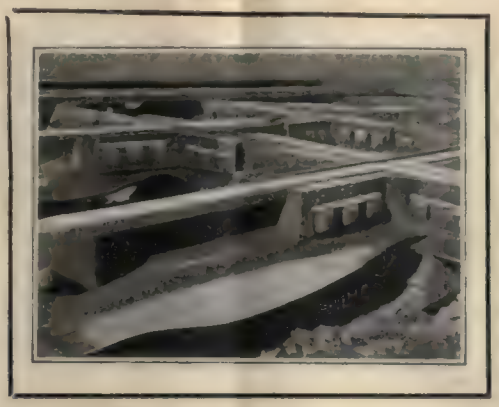
Send for Details and Quotations

DREW ELECTRIC & MFG. COMPANY

Representatives in principal cities

1016 East Michigan Street, Indianapolis, Ind.

176 Cars an Hour One Way 10 the other way—18-hour service



—on this crossing laid on special International Steel Foundation

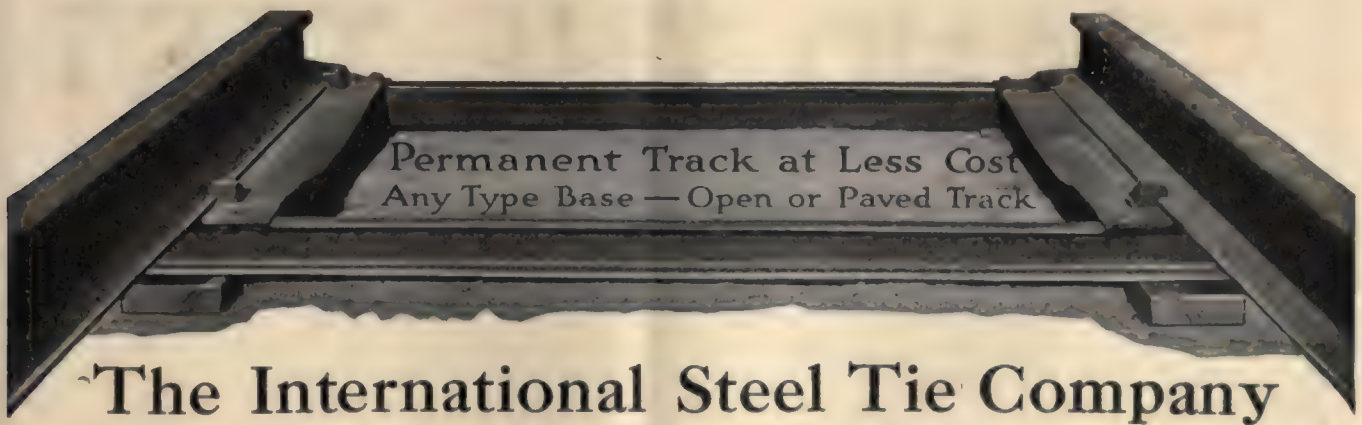
The man who hails from Denver knows the busy intersection at Curtis and Fifteenth streets.

176 cars an hour one way—10 cars an hour the other—and this for 18 hours a day.

Recently a new crossing was laid here. The outstanding feature of the work was the type of square crossing used. It was made up with 100-lb. rail and manganese flange-bearing risers and exceptionally heavy knee irons. The squares, which weighed 5000 lb. each, were laid on a crossing foundation of special type built by this company. No matter how good the crossing, it is the foundation that will make it or break it.

And the same holds true of ties—the foundation of your track.

Let us give you full particulars of International Steel Ties and Specials. Prompt deliveries made from stock.



The International Steel Tie Company

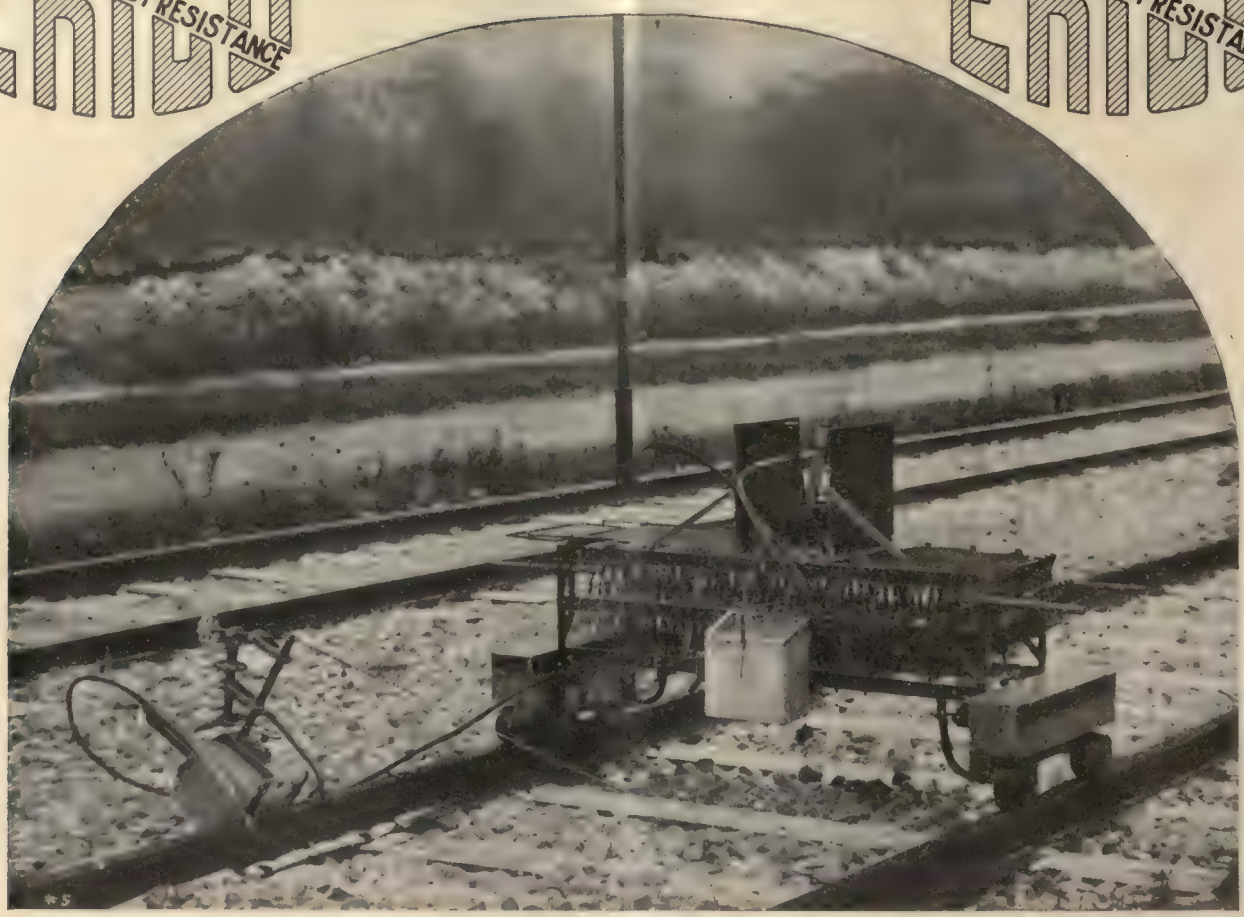
Manufacturers of Steel Twin Ties and Crossing Foundations

General Sales Office and Works: Cleveland, Ohio

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ERICO
THE LINE OF LEAST RESISTANCE



ERICO
THE LINE OF LEAST RESISTANCE

SAVE!

Good Bonding Saves—

Time—Enables you to maintain schedules.
Equipment—Prevents burned out motors.
Man-Power—Smaller crew and shop force required.
Coal—Stops unnecessary losses in return circuit.

Arc Welding Saves—

Time—Lost in waiting for new equipment.
Equipment—Reclaims articles you otherwise would scrap.
Man-Power—Cuts down the demand for new equipment.
Acetylene—Needed by ships and ship yards.

The ERICO Portable Rail Bonding and Arc Welding Outfit will save you money and save resources needed by the Government

SMALL INVESTMENT—PROMPT DELIVERY

THE ELECTRIC RAILWAY IMPROVEMENT CO.
CLEVELAND

And now Denver adopts "Golden Glow"—hear what they say



For their City Cars

The Denver Tramways Co. like hundreds of other progressive railways, are installing "Golden Glow" headlights on their cars.

The clipping, illustrated, which is reproduced from their own publication (Tram-O-Grams) is but another typical instance where "Golden Glow" has proven its superiority.

After a year of experimenting, Denver Tramways frankly tell you that "the safety of 'Golden Glow' is obvious"—that they "throw a very strong light without a glare."



For their Interurban Cars



Tramway cars are being equipped with the latest type of golden glow headlights. They replace the old arc and plain incandescent headlights. The safety of the golden glow is obvious. the improved golden lens that we finally selected after a year of experiment throws a very strong light without a glare. Incidentally. the new lights will be less apt to get out of order than the old.

In other words — Denver Tramways has cast aside all of its "old arc and plain incandescent headlights" and substituted the famous, always-efficient "Golden Glow" Headlights.

Denver Tramways reached a decision on "Golden Glow" after long experiments — surely there should be no question in your mind as to the proper headlight to use.

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

Canadian Distributors: Lyman Tube & Supply Co., Montreal, Toronto, Winnipeg.



Mudge Class E-6 "Safety-First" Inspection Car

A Type for Every Need

We build Mudge Motor Cars in types and sizes to meet every requirement. Several exclusive patented safety features are common to all Mudge Cars and make them strong favorites with the men. Let us supply full details. Write for illustrated catalog.

We are railroad motor car specialists

Here's Service and Economy Combined for Crew Transportation or Inspection

When you send out men over your lines see that they travel on a MUDGE MOTOR CAR. The handcar is slow and it gets your men to the job all tired out. It is not unusual for one crew with a MUDGE CAR to handle two sections where hand cars were formerly used. Gasoline is cheaper than human energy. Save your man power.

MUDGE MOTORS CARS



Mudge Class G S-3 with Patented Safety Railings

put your crews and inspectors in close touch with their work. They provide a quick and easy means of transportation, not only for men, but for small quantities of material as well.

MUDGE & CO.

Railway Exchange

Chicago

WESTERN RED CEDAR POLES



In Louisville
Kentucky

Louisville Railway Co. Lines

No. 1

Shelby Street South from Kentucky Street
60 ft. Western Red Cedar Poles installed 15 years ago
9—1/0 Stranded 3-Braid Aluminum cables.
14—No. 12 Iron and Copper clad telephone wires.
4—500,000 CM 3-Braid Copper Cables.
1—Span wire.

No. 2

Fruzer Ave. East from Shelby
45 ft. and 60 ft. Western Red Cedar Poles installed 17 and 15 years ago.
9—1/0 Stranded 3-Braid Aluminum Cables.
8—No. 12 Iron and Copper clad telephone wires.
2—1,000,000 CM 3-Braid Copper Cables
13—500,000 CM 3-Braid Copper Cables.
2—4/0 3-Braid Solid Copper wires.
2—No. 4 3-Braid Solid Copper wires.

No. 3

Shelby St. South from Fruzer Ave
60 ft. Western Red Cedar Poles installed 15 years ago.

Western Red Cedar Association

Peyton Bldg.
Spokane, Washington





The Lincoln System of Arc Welding offers the best opportunity for repairing your present tracks

BECAUSE of the present shortage of materials and labor, it will be almost impossible to lay new track during the period of the war, but you cannot afford to neglect present track—it should be repaired for service until conditions improve.

Lincoln equipment makes it easy to carry out this policy of conservation and put your tracks in good shape at the minimum cost. **One** Lincoln outfit will do **all** your repair work—welding joints, bonding rails, repairing frogs and crossings, and all general track repairing and shop welding.

By the patented Lincoln process, the work is done so quickly that repairing may be done without interrupting regular traffic schedules.

The Lincoln Dynamotor welds so thoroughly that the welded section will "stand up" as long as the rail to which it is applied.

The Lincoln outfit is light in weight, all self-contained in a wheel cart, so it can easily be taken to and from the job by one or two men.

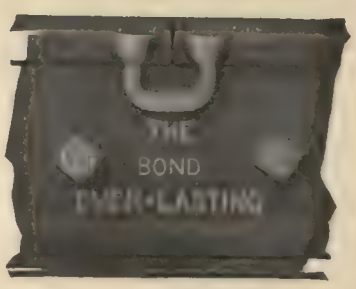
The same outfit can be used later for welding joints and bonding new rails.

It will pay you to get the facts of the Lincoln outfits. When may we explain in detail?

Write us or our nearest agent, today!



Gailor Welded Rail Joint



Lincoln Rail Bond

THE LINCOLN BONDING CO.

General Offices: CLEVELAND **New York Office: 30 Church St.**

BOSTON, Chas. N. Wood Co.
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Reliable AMERICAN ARMCO INGOT IRON Handsome AMERICAN ARMCO INGOT IRON Lasting

Resists Rust Resists Rust

These are the characteristics of

"ARMCO" IRON CULVERTS

verified by the experience of thousands of satisfied users.

All details of construction are in keeping with the high quality of their material. The strongest claim ever made for other culverts is that they are "just as good."

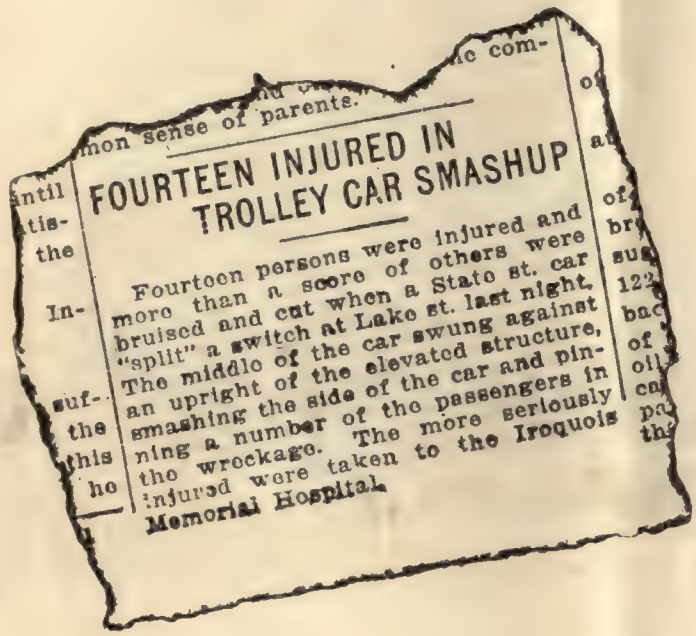
Write the Nearest Manufacturers for particulars and prices on Rust-Resisting "Armco" (American Ingot) Iron Culverts, Flumes, Sheets, Roofing and Formed Products.

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Dixie Culvert & Metal Co.
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North East Metal Culvert Co.
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Pennsylvania Metal Cul. Co.
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Texas, Dallas
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A Positive Switch Point Lock

That Locks Right and Left



FOURTEEN INJURED IN TROLLEY CAR SMASHUP

Fourteen persons were injured and more than a score of others were bruised and cut when a State st. car "split" a switch at Lake st. last night. The middle of the car swung against an upright of the elevated structure, smashing the side of the car and pinning a number of the passengers in the wreckage. The more seriously injured were taken to the Iroquois Memorial Hospital.

Waterproof
Dustproof
Non-Freezable
Indestructible
Inexpensive

The Weiss Switch Lock

Eliminates Split Switches



This lock is a safety necessity for street and interurban railways. It is waterproof, non-freezable, mud and sand proof. A positive locking device and locks both right and left. The Weiss Switch lock locks the switch so tightly there is no fear of splitting the switch. It is simple in construction. The small number of parts, the precision of their operation and the correctness of their arrangement will readily be appreciated.

There is a Weiss Switch Lock to fit any rail section. In ordering always give measurements from top of rail to center of bolt holes. Many prominent roads are using these locks.

Trial installations sent on approval

WEISS SWITCH LOCK CO.

312 S. Fifth St., Springfield, Ill.



439

New York Railways Cars Use National Pneumatic Safety Interlocking Door Control

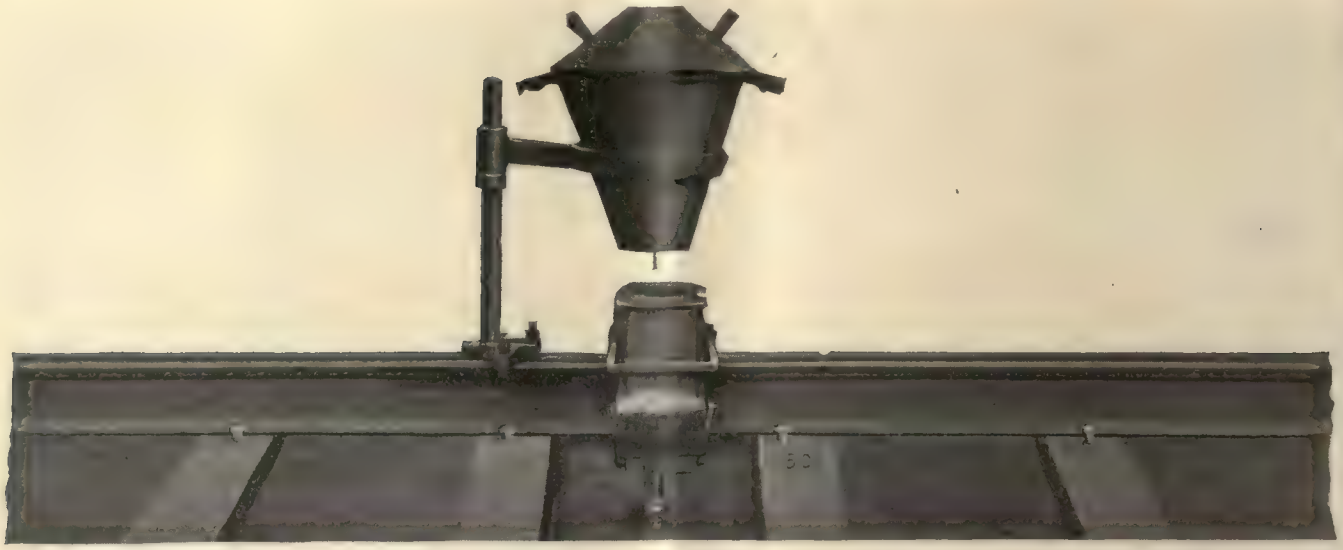
That the problem of increasing both the speed and safety features of the all-enclosed car is met by National Pneumatic Safety Interlocking Door Control is indicated by its application to 439 cars by the New York Railways.

With this apparatus a car cannot start until the doors are closed; but when the doors are closed the car starts automatically and instantaneously on the first point of the controller.

NATIONAL PNEUMATIC COMPANY INC.

50 Church St. New York

515 Laflin St. Chicago





1. Applying Molasses to Asbestos Strips for Luting between Edge of Mold and Rails.



2. Applying Asbestos and Molasses Strips to Rails previous to Adjusting Mold.



3. Adjusting Two-Part Mold to Rails.

How Do You Join Your Rails?

The Thermit Insert Weld has made the mechanical joint an unnecessary evil. When you use Thermit Insert Welds you do not have to worry about the inevitable arrival of the dished joint despite most careful grinding and matching up at the installation of new rails. You begin with a smooth track and keep it.

Metal & Thermit Corporation

120 Broadway, New York

Successors to

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4. Mold and Crucible Compound in position ready for preheating—box containing Thermit additions.



5. Preheating Rail Ends. Heating Thermit additions and baking mold in one operation.



6. Finished Thermit fully welded. Insert Rail Joint.

Now Doubly Effective



The Arthur Power-Saving Recorder

The use of *The Arthur Power-Saving Recorder* on more than 1200 cars has been accompanied by a steady reduction in amount of power used by those cars.

The Arthur Recorders which aided so powerfully in securing this reduced consumption accomplished the result by recording the operation of the air brake only.

Without sacrificing a particle of the value of recording brake operation Arthur Recorders as now made and installed also show a record of the operation of the controller in addition to the recording of brake operation.

With this added feature the Arthur Recorder makes it possible to accurately measure and definitely record the precise degree of skill and care which the motorman uses in the operation of his car.

Such a record forms the best foundation for safe operation and power conservation.

We have a booklet that tells all about it and will gladly furnish copy of it on request.

The Arthur Power-Saving Recorder Co.
Second National Bank Building, New Haven, Conn.

ATTENTION!

USERS OF BITUMINOUS COAL

THE ground storage of bituminous coal is today a real live issue with manufacturing plants and public utility corporations. But until today there was no system to do the job cheaply. Today the BEAUMONT DRAG SCRAPER SYSTEM will store and reclaim the coal and fight fire without costing an immense sum of money.

THE BEAUMONT DRAG SCRAPER SYSTEM costs but a small portion of the prevailing systems. It will store and reclaim any amount of coal, the only limit being the amount of property available.

WRITE for detailed information immediately and *get ready for next winter.*

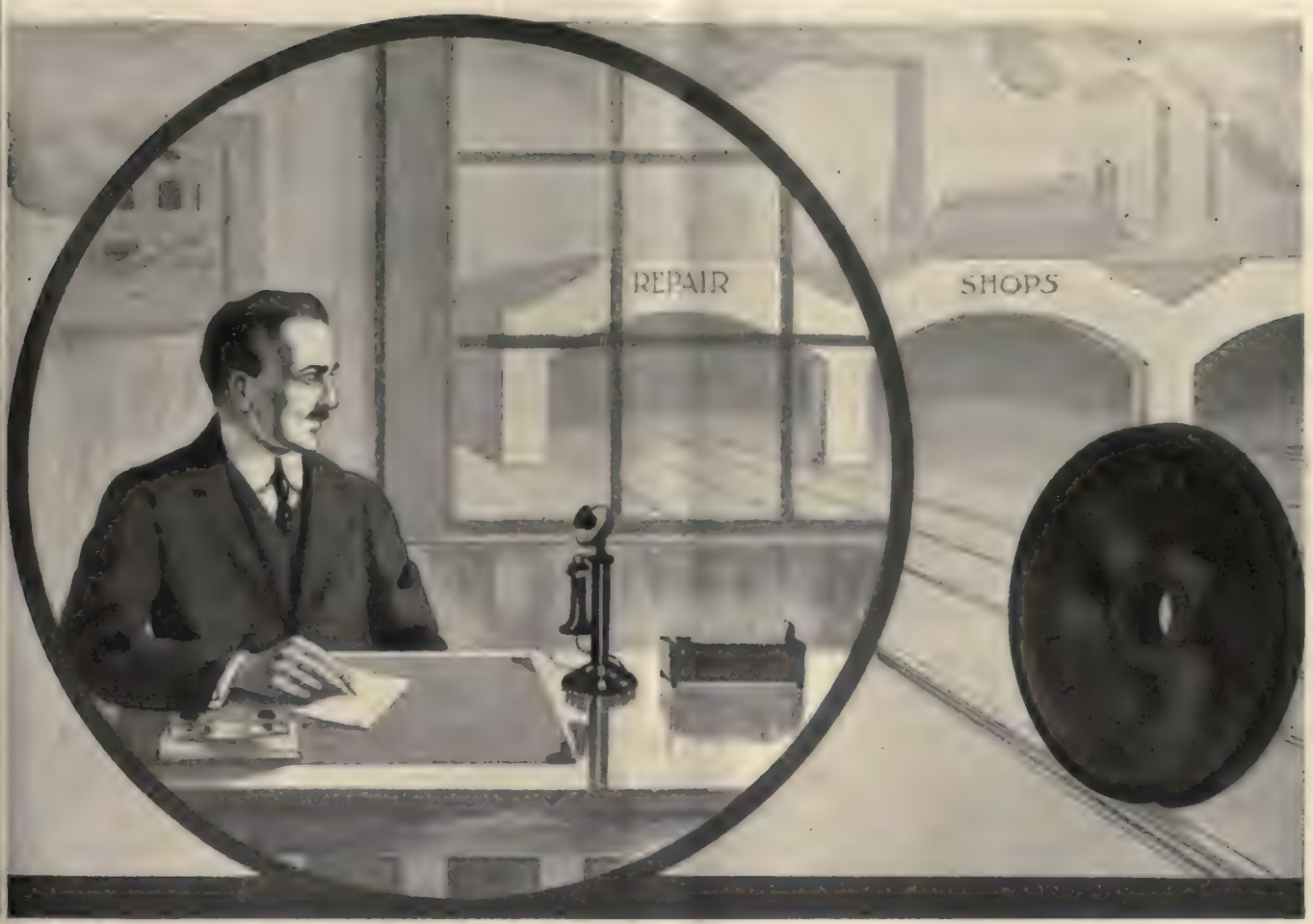
DELIVERIES CAN BE MADE QUICKLY

R. H. BEAUMONT CO.

111 S. 5th STREET, PHILADELPHIA, PA.

NEW YORK: 50 Church Street

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Car-Service Insurance

Cars must be kept producing transportation every minute. Cars standing idle in the shops for turning of wheel treads are incurring a revenue loss while out of service.

The operator of the efficient electric railway has his cars protected against service loss – he has them equipped with Davis One-Wear Steel Wheels.

AMERICAN STEEL FOUNDRIES

1100 McCormick Building, Chicago

DAVIS STEEL WHEELS

National War Savings Day June 28th

That's the day we sign up.

That's the day we tell Uncle Sam just how hard we want to win this war. That's the day our government has officially set for us to purchase War Savings Stamps.

On June 28th every man, woman and child in the United States will be called upon to pledge his or her full quota of War Savings Stamp purchases for 1918.

You will be expected to pledge the **full** amount that you can afford—no more—but by the same token, no less.

In every state, county, city, town and village the War Savings Committees are preparing for this big patriotic rally of June 28th. Unless you have already bought War Savings Stamps to the $1,000 limit, get busy with paper and pencil and figure out the **utmost** you can do.

Remember this. You take no chances when you go the limit on War Savings Stamps. They are the best and safest investment in the world. They pay you 4% interest compounded quarterly. They **can't** go below par. You can get back every dollar you put into War Savings Stamps **any time you need it.** You can turn them in at the Post Office **any time** for their full value plus interest.

Uncle Sam is asking hundreds of thousands of men to **give** their lives to their country He is asking you only to **lend** your money.

What are **you** lending?

National War Savings Committee, Washington.

W.S.S.
WAR SAVINGS STAMPS
ISSUED BY THE
UNITED STATES
GOVERNMENT

Contributed through Division of Advertising *United States Gov't. Comm. on Public Information*

This space contributed for the Winning of the War by
ELECTRIC RAILWAY JOURNAL



Three views of Rochester, taken in 1820, 1853 and 1884, respectively. If any city in the world has special reason to maintain a baseball club, this city should be Rochester, for the destiny of all western New York was affected as

The Result of a Ball Game

The Seneca and Erie Indians, both sport-loving tribes, played this historically famous game of ball (Lacrosse) in the summer of 1654, on the site of what is now West Main Street, and the game broke up in an argument over a decision of the umpire. A fight followed and the falling shades of night covered the beginning of the long, bloody war between these two "friendly" tribes. It ended in the expulsion of the Eries from the Genesee territory and the establishment of the Seneca Indians as the lords of Western New York.

The Seneca Indians permitted the white settlers to establish themselves along the Genesee River, and the foundations of Rochester were laid in 1789, when a flour mill was built at the junction of the Genesee River and Allan's Creek (Aqueduct and Graves Streets).

In 1802 Nathaniel Rochester, a lieutenant-colonel of the North Carolina militia, bought the "Hundred Acre Tract"—the center of what is now Rochester—for $1750, and the new city was named after him.

From such humble beginnings have nearly all the older cities of America grown, aided by efficient methods of transportation.

These methods have presented constantly changing problems in equipment and operation. In the solution of these problems

Galena Oils

and Galena Service have rendered great aid. Not merely in the providing of the right lubrication for a given need but also in suggesting methods for the adaptation and use of equipment.

Galena-Signal Oil Co.

Franklin, Pa.

Maximum Journal Wear

"Electroheat" Axles



A Brinell Testing Machine—In this machine a hardened steel ball, 10 millimeters in diameter, is pressed into the surface of the axle being tested, at a pressure of 3000 kilograms, and the diameter of the impression made is measured with a microscope. The harder the steel, the smaller the impression, and the dimensions of the impression obtained form the basis for calculating the Brinell hardness and the approximate tensile strength.

MAXIMUM wearing quality in steel car axles is obtained by heat treating the steel to produce the greatest grain density with proper surface hardness; but must be combined with strength, toughness, and elasticity. So the refinement of the steel to the proper degree of hardness requires scientific certainty in the heat-treating process.

That is why Laclede engineers subject each "Electroheat" quenched and tempered axle to a Brinell test to insure uniform hardness within predetermined limits by which an indication of the strength, toughness and grain structure can be obtained.

The application of the electric furnace to the heat-treating of "Electroheat" Axles gives positive, automatic control of the temperature enabling the entire process of annealing, or quenching and tempering to be carried on at the *exact* desired temperature, *uniformly* applied.

Note: "Electroheat" Armature Shafts possess the same torsional and shock-resisting qualities as "Electroheat" Axles, being heat-treated by the same process. They minimize service breakdowns and maintenance costs.

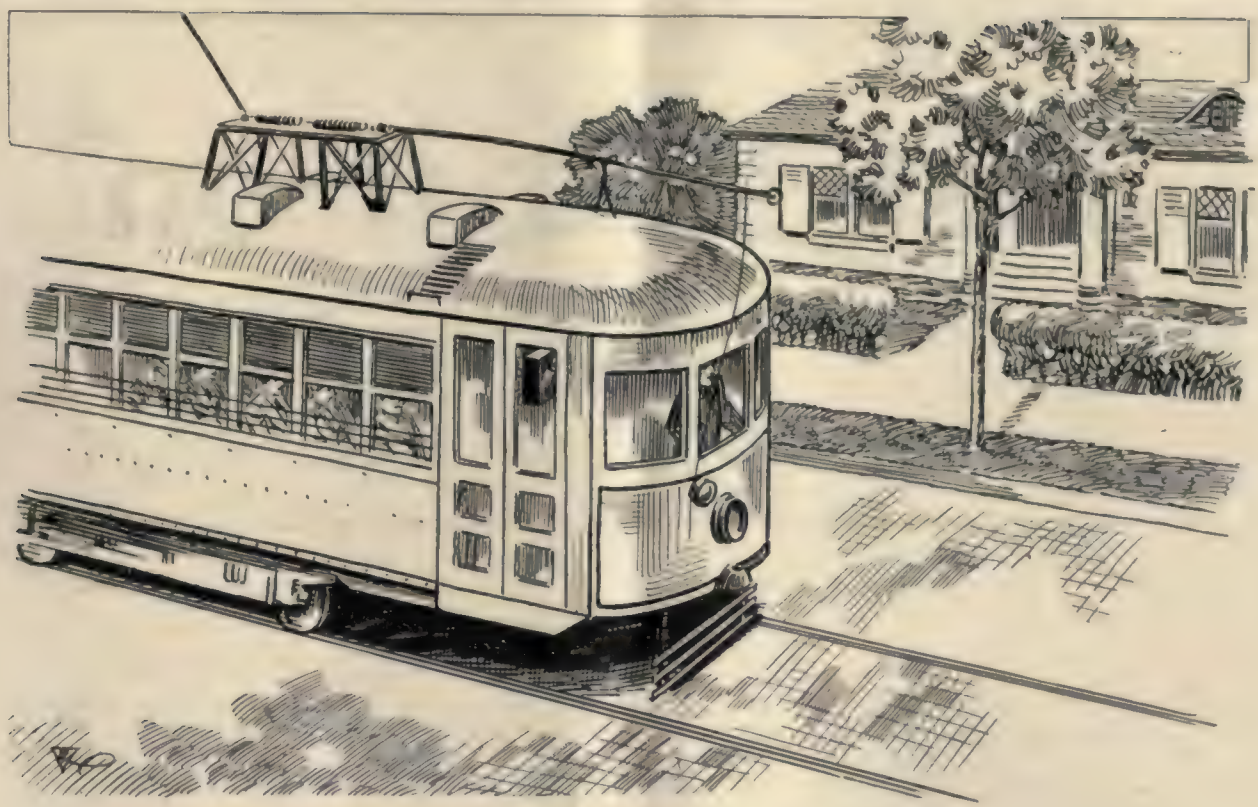
LOOK FOR VALSCO ON EVERY AXLE

"If Heat-Treated Electrically—It's a VALSCO"

LACLEDE STEEL COMPANY

General Offices—Federal Reserve Bank Building

Saint Louis, Mo., U. S. A.



You do not know

that your motormen are maintaining schedules correctly if you do not know how they operate their cars.

The index of their operating efficiency is the COASTING TIME record obtainable only with the

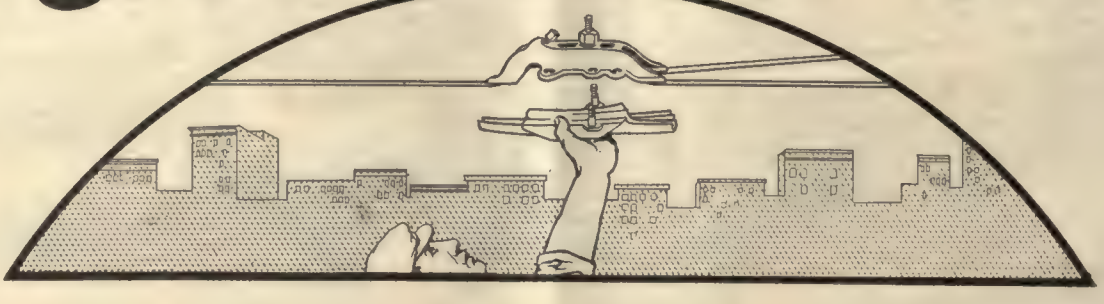
Rico Coasting Recorder

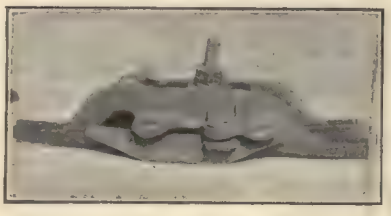


Time is the Essence of Railroading

RAILWAY IMPROVEMENT CO. RICO 61 BROADWAY, NEW YORK

"Just bolt it on"





Type N Frog (15°)

Cat. No. 200291—left hand
Cat. No. 200293—right hand
Cat. No. 200295—"V"

The wear is on one part only—A Renewable Pan which can be replaced at one-half the original cost of frog.

No pull-up tackle is necessary in making replacements.

The complete change-over can be made in two minutes causing minimum interference with schedules.

"A New Pan Makes a New Frog"

General Electric Company

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*Southwest General Electric Company. For Canadian Business refer to Canadian General Electric Company, Ltd., Toronto, Ont.
General Foreign Sales Offices, Schenectady, N.Y.; 120 Broadway, New York City; 83 Cannon St., London, E. C., England. 40-3

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 New York, Saturday, June 22, 1918 *Number* 25

The Supplement This Week Shows Our Marines

WE ARE PUBLISHING this week our third patriotic supplement, the subject being "Our Marines," who have been upholding American ideas in France during the past two weeks and adding to their illustrious record for bravery. The purpose of these supplements is to remind those at home of what our boys are doing and enduring abroad in their fight for civilization. If this is kept in mind there should be no danger of lack of support through profiteering on the part of employers or slacking on the part of employees.

The popularity of the previous patriotic supplements issued by this paper is shown by requests for additional copies which have come from all parts of the country—indeed, of the world. Thus one railway company in the Central States asked for as many as fifty copies of the last poster to put up in its depots, and through the head of a municipal department in an Australian city our first poster is being reproduced in that distant country to stimulate enlistment. The poster this week is by the same artist as the others and was drawn especially for the McGraw-Hill Company, Inc.

A Twelve o'Clock Railway in a Nine o'Clock Town

"I'M a Twelve o'Clock Fellow in a Nine o'Clock Town" ought to be the official song of the Norfolk division of the Virginia Railway & Power Company. Elsewhere in this issue we discuss some of the extraordinary and heroic measures which this company has undertaken to give the government all the transportation and power it needs for the great military work in Norfolk, Portsmouth and vicinity. The article does not discuss service in Norfolk itself, and with good reason, for service in Norfolk is no better than municipal regulations in a narrow-streeted town permit. These regulations, unfortunately, do not embody the fundamental mode of relief for a village with the population of a city—namely—the adoption of one-way operation for all traffic. If Philadelphia, Providence and San Francisco recognize the value of the one-way traffic idea, Norfolk certainly need have no fear as to rash pioneering. To be sure, a few favored property owners and business men will emit wails of anguish because half the traffic is taken off of their street, but the pain will prove temporary because they will soon see that more people will come down to shop and play if they have a reasonably clear space in which to move about. In Norfolk, conditions of congestion are so aggravated that it would be sheer folly to put on more cars for the simple reason that even the present schedules cannot be operated satisfactorily.

This situation was pointed out by the operating company long before the present phenomenal increase in population. Its plea was ignored then, and it is ignored now when not a minute should be lost in the completion of the great war projects in this section. In fact, unless the municipality rises to the occasion by instituting an immediate traffic survey to check, not oppose, the suggestions of the company, it may find the long arm of the federal government stretching Norfolkward, and Uncle Sam's arm is peculiarly elastic these days.

Practical Line Analysis a Good Reason for Zoning

IT WAS our recent privilege to look over a traffic study made in a town of 50,000 people with a view to proving the need, at a forthcoming hearing before the state commission, for a higher rate of fare. Quite a surprise was sprung upon the management when its expert produced statistics of travel not by lines but by fractions of lines. Here, for example, was a line 4 miles long on the first 2½ miles of which 70 per cent of the traffic originated, whereas the remaining, outer, 1½ miles produced only 30 per cent. Two things immediately became obvious: First, that many short riders would walk if they had to pay more than 2 cents a mile; second, that the long riders were getting too much service at an absurdly low rate of fare. This condition proved so prevalent that the company has already decided not to ask for a flat increase in fare but simply to put all the facts before the commission that the latter may decide whether real relief can be obtained in better ways than by the driving off of short riders.

Welfare Work Being Revived to Hold Platform Men

FOLLOWING a period of discouragement because it did not prove a sure cure for resignations and strikes, welfare work seems to be coming to the front again. Out of a score of properties visited recently about one-half had recently opened "at-cost" restaurants, and in some in the busier war centers sleeping quarters for unmarried men had been leased or built. Quite plainly such practices are dictated primarily by the acute shortage of labor and the high cost of living, but they have in them greater possibilities than saving a dollar or two a week for the platform man. No restaurant, no shower bath, no pool table, no punching bag, no anything will keep men in the service unless there is enough humanity behind these things to promote loyalty—love for the job and love for the boss of the job. The soldier and sailor

who are willing to lay down their lives are not doing it for pay but for loyalty. Many a railway man to-day is sticking to the platform despite the temptation of other work because he has learned to love his work under a management which takes a truly personal interest in him. Therefore, we earnestly beseech all managers who are installing or improving these facilities to continue to give their personal attention. The men will soon discover and immediately resent any attempt to put such important connecting links in the hands of a patronizing or indifferent subaltern.

Progress Being Made but Exact Date of Millennium Still Uncertain

ABNORMAL circumstances sometimes bring unusual results. Here in the United States we struggled for years to find a way to pull down that costly bugaboo—the rush-hour peak. Nothing would make a bend in it. And the fellow on the street figured the wonderful profits that seemed to exist in those hours of heavy travel. Various city and state supervising bodies insisted on showing the railway operators "how to make more money" by ordering still more cars to push up the peak. True, a few railway managers here and there were lucky enough to get the co-operation of business men who opened and closed their plants earlier so as to spread the peak and thus distribute the existing facilities of transportation to better advantage. But these cases were rare, and when reports of them were made at annual conventions, the other delegates only marveled that individuals could be so considerate, and they thought the situation too good to last. Then came the great war and the adoption of measures of economy in all lines of industry. Uncle Sam was a man of broad vision and promptly recommended skip-stop and other coal saving changes in operation, which led to some good results. At the seat of government in Washington, a strong appeal was made to those who could help to better the local service by closing stores and offices at different hours. Action of this kind is slow in making itself felt because it runs counter to that most inflexible law—habit, but there is hope that Washington will lead the way in this most important reform.

And now comes a brother manager from Cardiff, Wales, who has asked the press to inform women intent on shopping and not engaged in war work, that unless they could manage to do their buying in reasonable hours, they would be excluded from the cars altogether. He even suggests that it might be necessary for women to produce certificates to show that their business entitled them to ride in the cars.

We do not know whether to recommend this drastic measure to railway men in this country. In the first place, it is likely that a large proportion of the women patrons of our car lines would produce their knitting bags as evidence that they are engaged in war work and thus entitled to certificates of exemption. To speak seriously, there are many things being done now that would have been deemed impossible before the war. It may not be too much to expect that some authority will decree that cars during the working hours be reserved for working people. The millennium may be at hand.

Skip-Stop Principle of Small Cars Staves Off Jitney Competition

THROUGHOUT the land almost every electric railway is working on the skip stop. It's not so easy, however, for those who have jitney competition to do much skip-stopping when the jitney is ready to stop at the doorstep of the passenger. These roads rightly feel that literal obedience to the suggestions along these lines of the Fuel Administrator would cause them heavy losses of patronage so long as the gasoline engine—usually old and inefficient—could go merrily on its career of wasting man-power as well as fuel.

To many of these railways the small, one-man lightweight car has come as a solution. Through its very size it embodies that diminution of stops that must be fixed arbitrarily in the case of larger car operation. The best that can be hoped for by the national skip-stop program is a cut of one-third, and this is practically what the one-man car does because it carries say thirty-two passengers to the larger car's forty-eight. To be sure, the grand total of stops made by all the cars may be greater than before, but the cars that make them will be averaging 1 cent instead of 2 cents for power per car-mile. Hence there still will be a great saving in the use of fuel without the least inconvenience to the passengers or the loss of any of their patronage.

Show That Electricity Saves Gasoline

ONE way to take a cold bath is to plunge in boldly all at once; another way is to inch in gingerly—toes, ankles, knees and waist until the neck strikes water with a shiver and a b-r-r-r-r! The latter style of natatorial dissipation describes pretty fairly the way we have plunged into certain activities relative to the war. A good example is the conservation of that gasoline which is so badly needed at the battlefront where the use of the more efficient railroad is impossible.

Despite the repeated warnings of so competent an authority as Mr. Bedford of the Standard Oil Company, pleasure automobiles are still crowding our highways and are being used for joy rides literally by the million. Alarmed undoubtedly by the prospect of further curtailment in output, the automobile interests are now turning to the auto-truck, using its splendid emergency work "over there" as a specious argument for its unlimited use "over here."

From the very beginning of the war, the European belligerents made prohibitive the use of gasoline for non-war or important business purposes. So the ancient hack and ox-wain have reappeared in astonishing numbers. In America such a reversion would hardly be necessary. The elimination of jitneys and the retirement of private machines would, in many cities, lead to the use of good electric cars now idle. There is always also the possibility of the skip stop and higher rates of braking and acceleration for increasing passenger service without increasing cars or fuel requirements. As for auto-trucks, we have previously declared how wasteful they are in every respect in any district now supplied with electric railway facilities.

It is not human nature to expose one's own frailties, so we should not expect the automobile and auto-truck

interests to dwell upon the dark side of the shield. The job of preaching that gasoline should not be used extravagantly wherever other transport means are at hand is distinctly up to the electric railway man. Certainly patriotism and self-interest could not harmonize better.

N. E. L. A. Gets Right Down to Business

IF WE HAD not believed before in the value of national association conventions in war time, last week's gathering of the National Electric Light Association at Atlantic City would have converted us. The position of the ELECTRIC RAILWAY JOURNAL in this matter is, however, well known and it is not proposed at this time to rehearse the arguments pro and con.

The meeting at Atlantic City was characterized by consistency and concentration of purpose. The war has forced many and perplexing problems upon the electric lighting industry. These involve the labor supply, fuel questions, operating methods which shall insure continuous and satisfactory service under adverse conditions, financing, and many other kindred topics which stress the mind and vex the spirit of the public utility operator to-day. Such matters as these naturally provided the material for discussion at the Atlantic City convention. The abstract of the proceedings printed in this week's issue is intended to reflect the spirit of the meeting rather than exhaustively to report the letter of the discussion.

There are two important functions which are performed, with others, by a war-time convention properly planned and held. On the one hand it enables the organization which it represents to see itself in perspective. At the same time it demonstrates to the public and particularly to the government the nature, extent and operating conditions of its organization. It is very important at this time for our federal government to know the public utilities better. As the war progresses the government will assume more and more of control and responsibility in the utility field. It is obvious that a convention like that of the electric light and power interests, which are second only in importance to electric railways among the utilities, will serve to bring the government and these utilities closer together.

The National Electric Light Association is leading its industry in the movement for conservation. Its convention was marked by simplicity; no unnecessary expense has been incurred by its committees; it has reduced the size of its monthly bulletin for the purpose of saving paper; and through its committees it is bringing to the attention of its clientele valuable information which will enable central station companies to maintain good service economically.

The N. E. L. A. convention ought to be of great value to the electric railway industry, in preparing for the October convention. Compared with the usual attendance, the N. E. L. A. convention was a small one, but the influential people were there and that is what counts in these times. By the same token we may assume an attendance of proportionate size and the same representative character at our October convention. On account of the small attendance at Atlantic City it was possible to incorporate the section meetings, usually held separately, into the general program. This proved to be an effective plan, under the circumstances, in that it insured adequate attendance at the section meetings and also very effectively brought the work of the sections to the attention of the whole convention.

The electric lighting and electric railway industries are so closely related that somehow it ought to be possible to carry over the spirit of the June convention to that which is to be held in October. Can we not somehow so absorb the spirit of the former that when our own meeting convenes in October we can start off where the electric light people ended? This war-time spirit ought to be cumulative, and if everyone goes to Atlantic City in October with the determination that the convention is in some way to bring the end of the war a little nearer, the success of the convention is insured in advance.

The War Finance Bill in Its Present Shape Is Unsatisfactory

THE practical results of the war finance act have been a great disappointment to the utilities. The original purpose of the act was generally understood to be to help the public utilities and other essential industries to take care of issues of their securities as they should mature. In ordinary circumstances no such assistance would be necessary. Indeed such loans could probably still be negotiated in the former way, even at current interest rates, if it was not for the flotation of government bonds. But the government asks to be regarded in the loan market as a preferred customer. It says, and properly, to bankers and others who otherwise would absorb refunding utility issues, that their first duty is to the government. Take and help float government loans at 4 and 4½ per cent—so many railway men understood the purpose of the war finance bill to be—and the government will assist in caring for your maturing utility issues at a high, though not exorbitant, interest rate. The utilities hoped that such assistance would be direct, under Section 9 of the war finance corporation act, but under the present ruling it must in most cases be indirect through the banks, under Section 7. The formation of a corporation by banking interests to handle utility financing has been suggested, but this plan has barely passed the proposal stage. As yet many bankers seem reluctant to aid the utilities, because of the lessened earning power of such enterprises, and thus the expressed purpose of the lawmakers has been largely negatived.

There is every reason why the government should intervene in favor of the electric roads, because with both their income and expenditure controlled, they cannot help themselves. But entirely independent of equitable grounds, business policy should dictate prompt relief as a war measure. Unless it is afforded, receiverships in a great many cases are bound to result, with widespread injury to credit because of the extent to which utility bonds are held for investment, as well as with injurious effects on service which is necessary to war workers. In other words, an amendment to the war finance bill or a reinterpretation of it so as to afford direct relief to utilities is justified on both ethical and practical grounds. The government should step in, both to lend credit and to assist in increasing rates that the roads shall be more nearly self-supporting.

The Fuel Problem and the N. E. L. A.

National Electric Light Association Held Two-Day Convention Last Week at Atlantic City for the Discussion of War-time Questions—Principles Covered Apply to Electric Railways Also



HEADQUARTERS OF THE N. E. L. A. CONVENTION AT ATLANTIC CITY, JUNE 13 AND 14

A WIN-THE-WAR Convention was held by the National Electric Light Association at the Hotel Traymore, Atlantic City, on June 13 and 14. The sessions were held in a hall within the hotel. The attendance, which was about 300, was very representative. The keynote of the convention was that of patriotic service of men and companies. This thought was expressed in resolutions presented on Thursday afternoon by the committee on the president's address, Samuel Insull, chairman, which said in part, in referring to the war:

"With a realizing sense of the stupendous sacrifices involved, but with an abiding faith in the ultimate result, we pledge all that we have and all that we are to the holy cause."

THURSDAY SESSION

The presidential address of John W. Lieb not only discussed the work of the year but presented also a strong outline of our national ideals and unswerving purpose in the war. Defining the electrical industry as including electric railway, telephone and telegraph, electric light and power systems, and manufacturers on whose output these enterprises depend, Mr. Lieb said that this industry employs 920,000 men, represents $10,750,000,000 of invested capital and has an annual output of $2,675,000,000. Of these totals, the electric light and power industry represents 125,000 men, $3,000,000,000 invested capital and annual business of $575,000,000. He urged the central stations to pay especial attention to the linking up of regional systems so as to save fuel and increase reliability and economy of operation. He also advocated the further development of water powers as well as the advancement of the clock to be operative all the year instead of during a limited spring and summer season.

The secretary reported, among other war economies, that the monthly bulletin of the association had been reduced materially in size.

The membership committee reported a total membership as of June 10, 1918, of 11,440, divided as follows: Class A, 1083; class B, 9013; class C, 93; class D, 253; class E, 954; foreign, 44. This is a decrease of 3392 for the eleven months ended May 31, 1918, principally in class B and class E, due in large part to enlistments in military service.

The afternoon session was devoted to the reports of the national committees on gas and electric service, and public utility conditions and to the public policies committee, with a symposium on labor problems of the hour. In reporting for the national committee on public utility conditions, P. H. Gadsden pointed out that not only operating expenses are higher than ever before, but $250,000,000 in public utility securities will mature during 1919, and enormous investments are required to provide the increased service demanded by war industries. To provide the additional station and substation equipment alone, nearly $200,000,000 will be required in 1918. The serious part of the situation is that ordinary channels of financing are not open, owing to the war conditions. Between 600 and 700 rate increases have been allowed since Jan. 1, 1918, and it is hoped others will be secured. Mr. Gadsden said the committee was convinced that the federal government has the right to fix rates of public utilities which will enable them to exist in time of war. Whether it can be induced to do so remains to be seen.

At the annual dinner on Thursday evening addresses were made by P. B. Noyes, director conservation division, Fuel Administration; Samuel Insull, Dr. S. S. Wheeler, Arthur Williams and W. W. Freeman. Mr. Insull, in his address, said he wished to sound a note of optimism. While he admitted that the wording of the law creating commissions in some states is some-

what ambiguous so far as authority to increase rates is concerned, most commissions have authority to increase insufficient rates, and, so far as the electric light and power business is concerned, he hardly thought the industry had cause to complain about their decisions. It was reported that of the 460 applications made for increased rates in 1917, upwards of 400 decisions were given favorable to increases, and there are but few cases presented to commissions during the first half of 1918 where some relief has not been granted. A more serious trouble, in the speaker's opinion, is that of the refunding of maturing securities and the placing of new securities for necessary capital expenditures made during the war. But in his opinion, if the companies are diligent in the presentation of their situation to the authorities, they are bound to get relief.

The session on Friday was devoted largely to engineering topics. A feature of the convention was that the section meetings, usually held independently, were a part of the regular sessions. At the electrical vehicle section, a paper entitled "The Electric Vehicle as a War Measure" was presented by James H. McGraw, a member of the executive committee of the section.

On Friday afternoon W. F. Wells, vice-president and general manager Edison Electric Illuminating Company of Brooklyn, was elected president for the ensuing year.

The War and the Labor Problem

The Utilities, Confronted with Labor Shortage, Must Learn to Get Along with Less Labor and to Utilize Labor Normally Unavailable for Their Work

THREE phases of the labor situation occupied the attention of the Atlantic City meeting. These were the supply of labor to keep the utilities in operation, the distribution of skilled and unskilled labor among the industries and the utilization of the working capacity of soldiers returned from the front no longer fit for military service.

In the first connection E. S. Mansfield, Edison Illuminating Company, Boston, Mass., told how young women are being trained and used as substation operators on that property. Their employment for this purpose was the outgrowth of satisfactory experience in utilizing women in other classes of work where they replaced men, who had left the company for war work. Some months ago a class of eighteen girls was put under instruction for substation work. At first theoretical and book instruction was given but it was found later that what they needed was actual operation under instruction. They were, therefore, put through a regular course of closing switches and telephoning, load dispatching, receiving messages and checking them, etc., always under guidance. They were also examined as to their progress both orally and in writing.

Of the entire class fifteen were assigned to the Thirteenth Station, Rosedale, and they are now operating there, three on a shift of eight hours each, three shifts per day, six days per week. They are still supervised by a man attendant who insures co-operation, but eventually this supervision will be omitted. The girls are paid during instruction, at the same rate as the men, starting at about $15.40 per week. Eventually the use of the young women will be extended to other substations and it is quite possible that in time they will become the main dependents for substation operation. Among the qualifications considered for this work were originality, self-confidence, and quickness of thought to act in emergencies.

Getting Together on the Labor Question

At the meeting considerable interest was manifested also in what has come to be known as the "Rochester plan" of co-operation in labor supply. Rochester is a center of war munitions manufacture, and about a year ago the Chamber of Commerce undertook the formation of a central employment bureau for the purpose of furnishing workers for the war plants with minimum interference with other industries. By assessing a reasonable tax upon the establishments which would be benefited in proportion to the proposed benefit, a considerable fund was raised, and a superintendent with the necessary assistants was employed. Back of the bureau was a representative executive committee recruited from the ranks of leading business men.

At first a campaign of advertising in the surrounding territory provided a reasonable supply of men, but later it had been found necessary to provide for training unskilled workers for special tasks. In addition the ranks of workers for the munitions plants were filled by drafts made on other manufacturers. In the matter of wages it was early recognized that good wages must be paid in order to make working conditions attractive, and the wage data of the region were studied in order to insure reasonable equality of payment for similar service. At the same time figures of living costs were gathered, but the impracticability of raising wages in proportion to increases in cost of living was recognized. In explaining the Rochester plan James C. Hutchings, Rochester, N. Y., pointed out that to raise wages in proportion to increased cost of living means that a man shall have every comfort and luxury in war time that he enjoyed previously. It is obvious, said he, that we cannot hope to win this war and yet live as well as we lived three years ago. Eventually we may have one man out of six of the 36,000,000 active wage earners in the country prior to the war engaged in destruction at the front. Those behind the lines must make a sacrifice for the good of the work at the front.

Rehabilitating the Disabled Soldier

The third aspect of the labor situation discussed at the meeting related to the employment of crippled soldiers. D. H. McDougall, secretary Canadian Electrical Association, explained what had been done in Canada along this line. There the work appears to be well organized and a systematic effort is made to enable returned soldiers to enter occupations to which they are fitted, while at the same time provision is made for training them for their new duties if necessary. It seems that there is great danger that returned soldiers may not feel inclined to go back to work, but rather to eke out an existence on their pensions. It is made clear to them in Canada that any compensation which they may receive for work done will not in any way interfere with their pensions.

The employment of returned soldiers fit for work and not suffering from disability is in the hands of the Provincial Soldiers' Aid Commission. There is also

a new commission known as the Department of Soldiers' Civil Re-establishment. The latter made an industrial survey of trades and occupations with a view to fitting the returned soldier into the industrial machinery with minimum risk of disappointment. A large number of occupations were studied with reference to the physical and mental requirements of workers.

VOCATIONAL TRAINING COMPULSORY

It was found that once a man had received his discharge there was difficulty in reaching him. Now a man must show that he has been interviewed by the industrial re-educational officer before a discharge is granted. Canada has adopted compulsory vocational training under discipline if a man is not able physically to resume his former employment. After discharge and perhaps in receipt of a pension, a man is allowed pay and certain expense money while undergoing vocational training. This amounts with his pension to about $50 per month, as a minimum, while the total payment may run up to $100 per month.

With special reference to men who have been blinded in the war, the considerable effort that is being made in their behalf in the allied countries was described by Dr. S. S. Wheeler, president of the Crocker-Wheeler Company, Ampere, N. J. Dr. Wheeler's own company has successfully employed blind men in winding coils for electrical machines, and he has succeeded in interesting manufacturers in France and Great Britain in the same work. At the Crocker-Wheeler works blind coil-winders are paid at piece rates and they are able to earn good wages without any contributions made to them on account of their infirmity.

CIVILIANS MUST "FIND THEMSELVES" WITH RELATION TO THE WAR

While on the subject of labor and the war it is not out of place to call attention to a paper by Arthur Wright, of London, England, also read at this meeting, on the subject of "War by Civilians." His contention was that it is not patriotic to wait until each citizen is forced into the occupation which will best enable him to contribute to the winning of the war, but he must take the initiative in the matter. The civilian should at once bring himself to believe that all that really matters at this time is the successful prosecution of the war.

While he did not make any specific suggestions as to what civilians in general could do, Mr. Wright called attention to the fact that in the allied countries there are many capable men and women who are devoting a great deal of time to rather insignificant work of a war nature, when with the necessary initiative they could be of vastly more use by using their special capabilities in some definitely efficient direction. He devoted his paper largely to controverting the following prevalent and pernicious fallacies: (1) The war cannot last much longer. (2) Business must be carried on as usual. (3) The war will necessarily ruin most businesses. (4) Civilians need do little on their own initiative, as the government will in due course call for all the help needed. (5) Owing to the terrible tragedies that are being daily enacted on the battle front, it is both unpatriotic and unfeeling to preach cheerfulness and optimism as to the future.

Progress in Electrical Machinery

Getting Greater Output from Existing Equipment Is the Task of Mechanical and Electrical Engineers Because They Cannot Get Much New Machinery

THE usual reports on power generation and distribution were not presented this year, but the committees brought out a number of valuable data. The committee on electrical apparatus showed that many companies have equipment with considerable overload capacity when compared to present-day ratings and temperatures. This could be more fully utilized. For instance, one plant had two water turbines which could develop 24,000 hp. each but the generators connected to them would not carry more than 10,000 kw. of load. By installing Sirroco fans on the rotors of the generators and inclosing the parts of the generators above the floor line, it was possible to supply cold air chilled by means of sprinkler heads so that 14,000 kw. could easily be carried. Later this was pushed up to 16,300 kw. with safety. Many companies also have increased line voltages to obtain greater line capacity by changing transformers from delta-delta to Y-delta connection.



EQUIPMENT FOR UTILIZING WOOD REFUSE FOR FUEL IN A HYDRAULIC PLANT STEAM AUXILIARY

The report of the committee on power generation was not available in finished form, as it usually is, but a statement was made that it will shortly be available through the technical press. The report took up such subjects as thawing frozen coal, storage of coal, methods to be used in handling coal, coal inspection, firebrick, boiler cleaning, etc. For the committee on underground distribution, E. B. Meyer, Newark, N. J., reported particularly regarding emergency cable practice. At the present time maximum use must be made of distribution equipment, and interruption of service to war industries must be avoided. It is especially important then to remember that the carrying capacity of cables is lower in summer and to increase the capacities of such cables particularly during hot, dry seasons. This can be done by the circulation of air through the cable ducts, circulation of water around the cable, hydration of the surrounding soil and moistening of cables and materials which conduct away the heat rapidly.

In special cases aerial cable has been used for operation at 13,200 volts. In one case the cable was insulated with paper on the individual conductors, with a paper jacket and a final covering of reinforced rubber over the whole. For mechanical protection a galvanized steel

tape was wound over the cable. Such construction permits the use of ordinary pole lines for cable support. Two or more cables may be installed and changes or repairs made on the circuits without taking out of service any line, except the one on which the actual work is being done. The aerial cable construction is, of course, to be used only in special cases where it is desirable to cross underneath highway or railroad bridges and where open wires are undesirable or underground construction costs prohibitive.

War-time Problems in the Power Plant

Coal Shortage Overtops Everything Else in the Minds of Public Utility Operators at This Time—Quality as Well as Quantity Is a Factor in This Shortage

IN THE FIELD of power generation the discussion at Atlantic City naturally centered in fuel conservation. P. B. Noyes, director conservation division, United States Fuel Administration, analyzed the reasons for the fuel shortage and raised the question as to how we ought to meet the increased demand of 100,000,000 tons of coal for the coming year. This will mean an increase of more than 220,000,000 tons in excess of anything mined before the present war. To emphasize the magnitude of the coal movement in this country he said that the entire wheat crop of the country could be moved in twenty-six days, using the average number of cars employed throughout the year in the coal movement, and the cotton crop in one and one-third days.

Mr. Noyes believed that the fuel shortage will be more acute next winter than last and the problem is how to secure an equitable distribution of the coal that will be available. He said that the Fuel Administration wishes to make the utility business a 100-per cent war industry and then to assure it 100 per cent coal. In the conservation movement the ideal is to get consumers



FORCED AIR CIRCULATION INCREASED THE CAPACITY OF THIS POWER PLANT

to realize that in saving coal they are keeping people at work and thus contributing to the winning of the war.

Following Mr. Noyes, Samuel Insull, president Commonwealth Edison Company, Chicago, Ill., among other things said that, while the orders, in general, issued by the Fuel Administration have had a tendency to reduce the load factor on power plants and hence the earning capacity of the business, he realized the importance of these orders. For example, while the first order as to electric signs affected the earning capacity of the Edison Company out of proportion to the saving obtained yet Mr. Insull would have issued the order himself had he been in Mr. Garfield's place. He attributed a part of the fuel shortage to the fact that, in Illinois at any rate, the miners are not working more than 60 per cent of the time, due to lack of open-top cars.

H. A. Wagner, president Consolidated Gas, Electric Light & Power Company, Baltimore, Md., urged the public utility companies to take a leading part in cutting down the use of open-top cars for non-essential purposes, bringing before public authorities and local fuel administrators the necessity for such action. Mr. Wagner also called attention to the poor quality of the coal now being furnished to utilities and suggested that if the quality were better fewer cars would be required to transport the coal. He thought that mines producing coal with high B.t.u. content should get more than their pro-rated supply of cars so that the greatest number of heat units possible might be available.

Water Power Can Save Some Coal

According to W. W. Nichols, Milwaukee, Wis., water power can be used greatly to reduce the coal consumption. Although 1917 was a year of light demand in water-power machinery, more than 1,000,000 hp. of this machinery was built and installed, representing a saving of 8,500,000 tons of coal besides a further saving in production, labor and transportation. Ten per cent of the estimated coal shortage of this year, therefore, would be met if the industry could do as well in installing water-power machinery.

Without building new plants development can be brought about by increasing the capacity of plants already built, and replacing machinery installed prior to 1911. By this means 6,000,000 tons of coal could be saved in the twelve months.

Referring to the possible effect of the development of water power on coal conservation, Philip Torchio, New York Edison Company, pointed out that at best the use of water power could only delay the exhaustion of our coal supply. The available water power in the Eastern States represents only about 8 per cent of all the power demand in that section, or 5 per cent of the estimate of Mr. Noyes for next year's demand. Mr. Torchio said that the average efficiency in generating energy from coal is 5¾ per cent, whereas now steam power can be produced at 19-per cent efficiency. The theoretical saving in coal by using the most economical means of generation would, therefore, be about two-thirds of the quantity now used.

Following Mr. Torchio, George A. Orrok, New York City, considered the possibilities of utilizing the culm which has accumulated around the anthracite mines. His data seemed to show that the amount of culm which is available for use is less than has been estimated by many. Of the 108,000,000 tons which have been dumped into culm banks in the last 130 years, one-quarter has probably gone back into the mines to prevent the falling in of the roofs or is otherwise unavailable; washeries have been in operation and have recovered a great deal of good coal also. Mr. Orrok also spoke of conveying coal by means of water. With water of one-half the volume of the coal, and with a 14-in. pipe and a velocity of 5 ft. per second nearly 4,000,000 tons of coal per year could be transported.

Electric Railways Are Serving the Nation

New Orleans Company Saves More Than 8000 Tons of Coal Annually Through Rerouting and Near-Side Stops—Shipyard Workers Operate Staten Island Cars—Service for Aviators and Shipbuilders at Dallas, Mobile and Beaumont

EVERY day electric railways are endeavoring to utilize their limited resources, as far as possible, to co-operate with government authorities in the prosecution of the war. The service performed varies, but a general idea of what is going on can be gained from sketches of the activities in different localities.

The ELECTRIC RAILWAY JOURNAL of June 1 contained a description of war work under way in certain Atlantic Coast cities. To this there are now added below several articles dealing mostly with Southern cities.

Sixty-five Seats per Passenger!

War Brings Rerouting in New Orleans—Curtailment of Waste Mileage Is Saving 5000 Tons of Coal and 138,335 Car-Hours a Year

FOR many, many years the New Orleans Railway & Light Company, New Orleans, La., has been suffering from a most wasteful multiplication of service under the franchise requirements of the underlying companies. It had become almost a sacred tradition to route practically all the lines along Canal Street, although crews and passengers had become tolerably familiar with the attractions of that famous thoroughfare. The cars were not content to go through only the busy section, but they wandered idly to a point (called Liberty Place) near the river.

Traffic checks showed that outside of five blocks in the center of the district so few riders were left that on the average each one had the privilege of using any of the sixty-five seats. This sounds fantastic, but it is true. All this waste was distressing—to the public, in causing unnecessary congestion, and to the railway, in causing unnecessary expense.

REROUTING TO AVOID WASTE MILEAGE

Finally, as a war measure to save coal, the company through Nelson H. Brown, manager of the railway department, put a thorough rerouting plan into effect on Dec. 23, 1917. The loop on Canal Street was shortened by landing passengers from lines terminating at Canal Street within a radius of five city blocks. Those desiring to continue to the river may do so by transferring to any of the six heavy trunk lines which use Canal Street between Rampart and Liberty Place. The lines have double-truck cars and short headways.

By the rerouting and changes on Canal Street, congestion was eliminated, speed was increased and headways were shortened. The following table shows the number of cars moved in each direction through Canal Street during the peak, before and after the change:

	To the River				From the River		
	Before	After	Decrease		Before	After	Decrease
Track 1.....	111	80	31	Track 1.....	111	80	31
Track 2.....	119	65	54	Track 2.....	119	77	42

Another study carried out at the same time reduced the excessive off-peak service and increased the peak service as follows:

	A.M. Peak	Noon	P.M. Peak
Cars before the change.....	392	306	441
Cars after the change.....	413	281	459

Through the more effective use of car-hours, eighty platform men were saved. No man lost his job, however, as applications were not accepted while the rerouting was under way. In addition, the normal ratio of resignation left practically no surplus. As a matter of fact, the draft may soon make a shortage.

The coal saving from the rerouting is at the rate of 5000 tons a year. Expressed in car-hours, the saving is equivalent to 138,335 car-hours a year. At 92.14 cents per car-hour for the operating accounts alone, the economy is a very welcome one—all the more so since it has been obtained by enriching the service instead of pauperizing it.

It should be added that before these changes became effective, the public received ample notice through car posters and comprehensive newspaper articles. In order still further to avoid annoyance and confusion, supervisors (inspectors) were located at the prominent street corners to direct people who were unfamiliar with the change.

Few requests for alterations in the rerouting plan have been made. On the whole, it appears to be as satisfactory to the public as it is to the railway.

Beginning on May 20, the company introduced a further improvement in service by abolishing the double stop (far-side and near-side) formerly in vogue at every rail intersection, whether steam or electric. The percentage of use of both stops at a crossing had been found to range from 25 to 60 per cent according to the time of day. By making stops on the near side only, the company saves 35,189 stops daily. At ½ lb. of coal per stop, this means 9 tons a day or 3285 tons a year—a tidy addition to the tonnage saved by the rerouting. Moreover, through the saving of ten seconds per stop, the running time is being reduced to the extent of from two to six minutes per trip. This saving is to the advantage of the public.

4000-FT. EXTENSION IS BEING BUILT

New Orleans has had no great enlargement because of war activities. The chief thing in that line is the shipbuilding plant which the Foundation Company is building on the Industrial Canal between the Mississippi River and Lake Ponchartrain. The canal itself will not be ready for eighteen months.

To serve the shipyard and other business that may develop, the New Orleans Railway & Light Company has begun a 4000-ft. extension of its Claiborne line with material from a postponed double-tracking of South

Claiborne. This track is laid directly on the neutral ground or park strip of France Street to Galvez Street. Eventually it will be extended still farther toward the lake.

The canal will also cause the Dauphin Street line to be shifted three blocks farther from the river to St. Claude Street, which will have one of the three bridges to cross the canal.

More Than 3500 Shipbuilders at Beaumont

BEAUMONT, Tex., is now busy with the building of wooden ships, and the community has hopes for steel and concrete ones, too. Toward the end of May about twenty-two ships were on the ways, and four had already been launched.

Of the five plants at Beaumont those of McBride & Law, with 450 employees, and J. N. McCammon, with 400 men, are within two blocks of the main street. The Tarver Shipbuilding Company, with 200 men, is within eight blocks of the Beaumont Traction Company's lines. The other two, the Lone Star Shipbuilding Company, employing 1300 men, and the Beaumont Shipbuilding & Dry Dock Company, employing 1500 men, are located across the river, but within half a mile of the company's lines. These two yards expect to employ approximately 500 additional men each within the next sixty days to equip the wooden boats that are being built in this section for the government. There will be fifty-two wooden vessels equipped for sea by these two companies.

The only changes in electric railway service thus far required have been increases at peaks and the earlier starting of interurban cars. Such cars now leave Port Arthur at 5.45 a.m. instead of 6 a.m., in order to accommodate about seventy-five shipyard and refinery workers who live there because of lack of housing facilities in Beaumont. Building in Beaumont, however, is now being actively carried on to avoid this. The Beaumont Chamber of Commerce figures that 10,000 people have been added to the population of 36,000 of a year ago.

Handling Aviators at Dallas

IN OR NEAR Dallas are two centers of the aviation forces—Love Field, the headquarters of a flying squadron; and Camp Dick, a ground school. Love Field is 4½ miles from the center of Dallas. It has from 1000 to 2000 occupants. Transportation is *via* jitney, as there is no electric railway service direct to the field.

Camp Dick is located on the Dallas Fair Grounds and has a population of about 3400. Electric railway service is furnished by the south belt line of the Dallas Railway, partly with regular cars run on an eight-minute headway off-peak and a four-minute headway for peak service. Chartered cars are also used for the twenty-minute run between the camp and either the steam or interurban terminal in Dallas, at a charge of $4 one way or $7.50 round trip. These chartered cars are likely to average 100 occupants. They are run chiefly for special occasions like train connections. Since the beginning of this service the car-hours of this line have been increased from about 255 to 276 a day and the earnings about $100 a day.

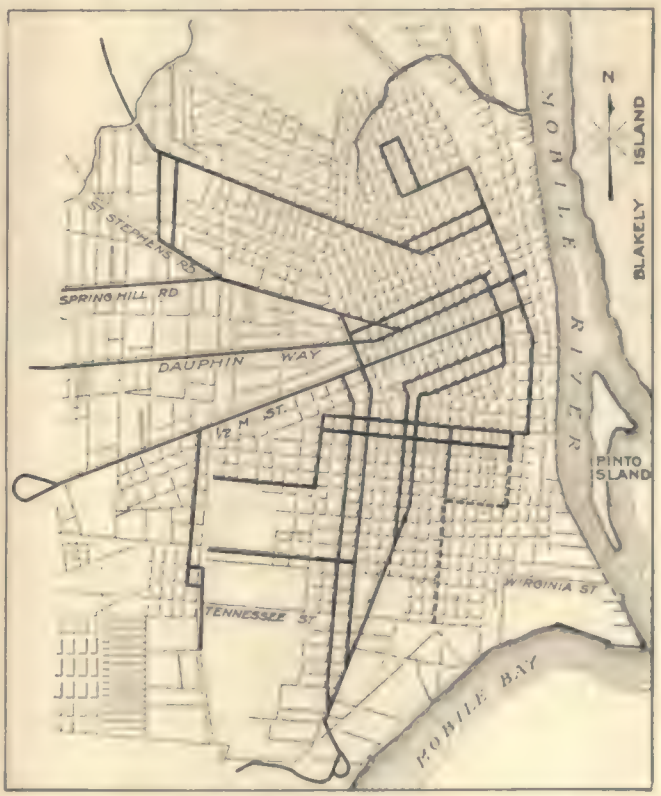
Mobile's Piers in the Bridge to France

Much Shipbuilding Within Mobile—Outside, at Chickasaw, Is a 13,500-Acre Yard and Town Development of Steel Interests—New Railway Facilities Required

THE splendid location of Mobile as a shipbuilding center has not been overlooked by the Emergency Fleet Corporation, the United States Steel Corporation and other big interests. Hence not only is the waterfront in Mobile itself covered with ships on the ways, but preparations are also going on outside for the making of fabricated steel ships, at one of the most elaborate housing developments in the country.

BIG ACTIVITIES AT CHICKASAW

To take this last-named work first, the salient facts about it are these. In 1917 the United States Steel Corporation, through its subsidiary the Tennessee Coal & Iron Company, bought a wooded tract of nearly 21 square miles (13,500 acres), bigger than Mobile itself, at Chickasabogue (Chickasaw Creek) 5 miles up the Mobile River. Although clearing did not begin until November, 1917, a recent visit to the property disclosed the fact that scores of buildings for the workers



NEW SHIPYARD LINE PLANNED FOR MOBILE
Solid lines, existing railway; dash lines, proposed extension

had already been completed. The housing development alone calls for two self-contained towns, 1000 dwellings for negroes and 600 for whites. At this plant the Chickasaw Shipbuilding Company, the subsidiary shipping company formed, will build 9600-ton steel ships for the export business of the United States Steel Corporation. Thus this development is not primarily for the present war alone. About 6000 men will be employed here soon, and eventually 20,000.

To give electric railway service in this district the

Chickasaw Shipbuilding Company has built a 2-mile line on its own property to connect with the Prichard-Magazine-Whistler suburban line of the Mobile Light & Railroad Company. This suburban line is a single-track route up to Prichard, the end of the 5-cent zone. There the line bifurcates, one branch going to Whistler and the other to Magazine Point, the rate on each branch being 10 cents. The shipyard connection is beyond Prichard, making a third fork.

Until recently the private 2-mile line was incomplete, no copper having arrived. In the meantime the shipping company was giving a temporary service with two open trailers, leased from the Mobile Light & Railroad Company, and hauled by a steam locomotive. It is expected that on June 24 the line will be operated by the Mobile Light & Railroad Company. This will permit the through routing of cars and make it unnecessary for the shipbuilders to maintain a railway organization.

As before stated, shipbuilding developments are also being carried on within Mobile, where there are five companies building ships, employing about 3500 men.

Public Utility Representatives Confer With Fuel Administration Regarding Coal Conservation

A CONFERENCE was held at Philadelphia, Pa., on June 12, between representatives of the United States Fuel Administration and the public utilities of the State for the purpose of furthering measures instituted to conserve fuel.

The discussion was concerned primarily with the skip-stop system of electric railway operation, and it developed that it would be necessary for the Pennsylvania Fuel Administrator to initiate the discussion of the skip-stop plan through the county representatives. It is understood that these will be instructed to get in touch with municipalities and companies operating in their local districts, while the State Administrator will get in touch with the Public Service Commission.

Bulletin No. 1957 of the United States Fuel Administration was made the basis of further discussion on the general subject of coal conservation in the boiler room, regardless of the skip-stop system. The bulletin mentioned contains a questionnaire, from which a number of questions are reproduced below, as they suggest possible lines of fuel saving. The first section of the bulletin contains forms for recording local power plant data, concluding with a query as to the changes which are in progress which are expected to reduce fuel consumption and when these will be in effect.

The second section of the bulletin contains these and other operating questions:

Fuel—What provision is made for weighing fuel used each shift or day? What records are made of fuel used each shift or day? What grate surface is in use each shift, exclusive of banked fires? How much coal is used each shift, exclusive of banked fires?

Air Supply—Are means provided for measuring the draft over the fire? Are means provided for determining the excess air by flue-gas analysis? Are dampers provided for equalizing the draft in the furnaces? Is there a convenient means for regulating the draft by main or up-take dampers? Is there an automatic damper regulator in working order?

Boiler and Furnace Settings—Are the grates warped, broken or otherwise defective? Where have air leaks been observed?

Shipbuilders Running Cars

Former Employees of Staten Island Railway, Partly Paid by Shipping Authorities, Operate Cars To and From Work

OWING to the shortage of labor on Staten Island, N. Y., the operation of electric railway cars to the local shipyards is being cared for by shipyard workers with previous railway experience. These shipyard men run the cars out of the carhouse of the Richmond Light & Railroad Company in the morning, take loads of shipbuilders to work and then go to work themselves in the yards. The cars stand on sidings during the day. After finishing their day's work, the shipyard car operators bring the other shipbuilding employees home. The cars are then stored at night as usual.

The cars are in operation from two to two and one-half hours daily, and during this limited time they are handled as in normal or regular runs. The working conditions of the men differ in no respect from those for regular operation. From seventy-five to 100 passengers are carried on a car in each direction. Twelve cars are now in use, but the number will be increased to twenty.

At present there are twenty-four former conductors and motormen of the Richmond Light & Railroad Company operating the cars. These men form part of the 125 to 150 employees of the company who left for shipyard work when this was begun on Staten Island. The pay of the car operators is shared between the shipyards and the railway. The regular shipyard pay is 50 cents an hour, with time and a half for overtime. The regular pay of the railway is 30 cents an hour. Under the arrangement with the United States Shipping Board, the railway pays the car crews 30 cents and the shipyard authorities 45 cents an hour, making a total of 75 cents an hour at the overtime rate.

The general results of the use of shipyard conductors are a source of satisfaction to the company. The fare returns are commensurate with those secured in regular service. It would be difficult for conductors to tamper with the fare collection, however, for the passengers seem to appreciate the service and watch the conductors. Only two attempts to "knock down" fares have been observed and these were reported by the passengers.

The use of former employees on the shipyard runs, however, has not relieved the general labor situation confronting the railway. On the contrary, this is more acute than formerly, owing to the general labor stringency. The company now needs 100 men to make up its usual total. It has advertised in daily, weekly, Sunday and trade papers in seven states where there are organized industrial centers, but the responses thus far have been few and the results meager. No effort has been made to secure women conductors because of the use of open cars with running boards.

When the United States Shipping Board first made the proposition to the company to furnish transportation for the shipyard workers, the railway stated that it could not handle the work without assistance. It was then arranged that sidings should be built in the yards, with the board standing part of the expense. The cooperation in this respect and with regard to the assumption of part of the wage payment to the car operators has enabled the company to take care of the shipyard traffic.

Handling an Extra Hundred Thousand at Norfolk

For Government Work Company Builds a Million Dollar 66-Mile Transmission Line and Changes 20 Miles of Track to Broad Gage

IN JULY, 1917, business at Norfolk was below normal; by April, 1918, the population had increased from 100,000 to 200,000, exclusive of the large floating population of soldiers and sailors. This, in a sentence, is the result of war activities at Norfolk.

In all probability, the increase in population at this port equals that at Baltimore, Washington and Philadelphia, but the problem is immeasurably more acute in both the housing and transportation aspects because Norfolk could not possibly absorb all the newcomers, or a large proportion of them, by the device of turning residences into rooming houses.

As for railway service, the same degree of difficulty obtains. Norfolk with its narrow streets is simply an overgrown village, and its administration has retained the village viewpoint. This is clear from the fact that Granby Street, the main thoroughfare, is so narrow that vehicles cannot be run between the rails and the curb. Yet the municipality has not yet considered the logical remedy of routing a number of the downtown streets for one-way car and vehicular traffic. As usual, the selfish interests of land owners and business men in the congested section are allowed to hamper the general welfare of the city.

Thoroughly satisfactory street railway service was impossible even before the present boom conditions began. It may therefore be imagined what obstacles the Virginia Railway & Power Company must encounter now, not only in serving the usual city routes but also in meeting the imperative needs of the new governmental depots.

PRINCIPAL DEVELOPMENTS IN NORFOLK DISTRICT

The principal developments which have created such an extraordinary demand for more facilities in the Norfolk district may be summarized as follows:

Naval Base 9 miles from Norfolk on the site of the 1907 Jamestown Exposition, near Sewell's Point, involving a development of $30,000,000 to $50,000,000 on 400 acres of existing ground and another 400 acres of fill. Many of the State buildings of exposition days, which had been converted to residences, are now being used for officers' quarters, in addition to the hotel. Hundreds of new buildings for storage, training and other purposes have already been put up and more are coming.

Norfolk Quartermaster's Terminal, U. S. A., at Bush Bluff 6 miles from Norfolk on the way to the Naval Base. Here about 6000 men are employed in making piling and erecting eight storage warehouses of concrete, brick and tile, each 160 ft. wide by 1680 ft. long. About 13 miles of track are used here temporarily by the contractors. Housing is being provided for about 4500 of the men, but this does not prevent practically all of them from going to Norfolk when they have the money. It is hoped to complete construction work here before cold weather sets in, thus calling only for the use of existing open cars as hereinafter noted.

Tripling in size of the Portsmouth Navy Yard, involving an addition of 35,000 to 40,000 men to the population of Portsmouth.

Construction of U. S. Engineers' Depot in Norfolk, at which about 1500 stevedores are employed.

Deepening of harbor to increase the width of the 40-ft. channel from 400 ft. to 800 ft.

Amusement travel of soldiers and sailors from Newport News.

CHANGING 20 MILES OF TRACK TO WIDE GAGE

One of the greatest difficulties which faced the Virginia Railway & Power Company in giving service to the outlying developments was the fact that the lines



CHANGING THE TRACK GAGE IN NORFOLK FOR WAR PURPOSES

to the Jamestown Exposition (Naval Base) grounds and to Ocean View, 14 miles from Norfolk, which afforded a second route thereto, were 4-ft. 8½-in. gage whereas the Norfolk city lines were largely 5 ft. 2 in. To have attempted to change everything to standard gage would have involved at least three times the expense and far more time than to change these lines to broad gage, inasmuch as most of the special work was of the latter gage. Moreover, most of the standard gage track was open construction. This made it possible to change the gage of 12 miles of track—Norfolk to the Naval Base—in two days. Another 8 miles will be changed over soon to care for the Bay Shore line to Ocean View, making a total of 20 miles changed over. This leaves only 2¼ miles standard-gage track owned by the Virginia Railway & Power Company in Norfolk

plus 0.8 mile of track owned by the Norfolk Southern Railroad. This standard-gage track is shown on the accompanying map in the form of a badly-bent "T," the east-west leg of which is owned by the Norfolk-Southern while the portion south of the junction is operated in common by the two companies. At the Naval Base also, about 1 mile of track remaining within the grounds has been left at 4 ft. 8½ in. and leased to the government.

It may be added that the lines in Portsmouth and Berkley remain standard gage, except for the new Berkley Bridge and approach.

Through the expedient of changing the Jamestown Boulevard line to broad gage there were made immediately available forty open cars used for pleasure travel on the broad-gage line which serves Ocean View. In addition twelve closed motor cars were borrowed from the Norfolk city lines, and another forty-eight are to come. The latter loan will include twenty-four open trailers from Richmond. Out of 100 cars for the Naval Base and Quartermaster's Terminal service, nevertheless, fifty cars must be fitted for change in gage.

Aside from these changes, the company is using at Norfolk sixteen new vestibuled motor cars which arrived from the St. Louis Car Company last December in fulfillment of an order placed long before the various developments just described were expected.

Absence of Staggered Hour Blocks Thoroughly Satisfactory Service

Except for the fact that the men at the Quartermaster's Terminal are released half an hour earlier than those at the Naval Base, almost all the workmen must be handled simultaneously. There is not enough difference in time to use cars more than once. Since this service also overlaps the peaks in Norfolk itself, it is evident that the transport problem is most difficult. When the closing hour is sounded at the Naval Base, thousands upon thousands of laborers, hundreds of mule teams and motor trucks and scores of automobiles make one mad scramble to get out of the stockade as if they were trying to escape from imminent death. Despite the fact that scores of cars are standing in line only the first suitable one will do. Men will be seen hanging to fenders even when there is plenty of standing room inside, their obvious purpose being to escape the payment of fare. A prepayment area outside the Naval Base does not appear practicable to the company because of topographical conditions and the use of a 5 and 10-cent fare.

Partial relief, so far as preventing the clogging of the line is concerned, will be afforded here and at Sewell's Point by the construction of a third track for the storage of twenty-five to thirty cars.

The service from the Naval Base, as at other points, is handled in trains of two or three cars. To move two trailers at good speed is not difficult because of the entire absence of grades. Through runs are made wherever practicable.

If the company had any assurance of the permanence of this business, it would order multiple-unit equipment and operate five-car trains or more, but obviously it must meet the present conditions as best it can with existing equipment. The ideal arrangement for handling the twice-a-day traffic to and from the Naval Base would be to borrow an old steam locomotive and use it to haul a train of coaches. The Virginian Railway could have done this by running a spur, but it did not care to disturb its freight business. However, the electric railway is now negotiating for steam equipment which may be used if proper arrangement for payment of fare can be made with the government.

In explanation of the foregoing, it should be stated that Naval Base employees are granted a railway fare allowance of 20 cents per diem whether they live in 5-cent or 10-cent zones. Because of the undisciplined way in which they board the cars, however, so many fares are missed that the service is unprofitable. If the 20 cents per diem per man was paid directly to the railway, the men could ride on badges good on the specials. This would simplify the work of the trainmen enormously and also segregate this travel from other services. However, the simplest, cheapest solution would be to stagger the working hours of the men at the Naval Base at least, since they constitute the bulk of the travel.

Beside the service given by the railway, there are a number of automobiles and privateering motor trucks. The automobiles charge 25 cents for the trip. The motor trucks are not supposed to be used for this service, but many drivers are careful to hang about the Naval Base, after delivering their employer's supplies, for the personal profit of carrying a load to town at 10 cents per rider. Only a nominal license fee is charged for auto vehicles by Norfolk anyway.

The laborers at the Quartermaster's Terminal are not only smaller in number but also far more orderly. At this location, the company has built a loop where sufficient cars are stored to give prompt service.

Aside from the twice-a-day peak service required at these military bases, provision must be made for the riding of men on leave. This kind of traffic is extremely erratic. Regular days of leave may be suddenly canceled, an unusual number of men may receive a day off, or the expected travel will not materialize because pay day is too far away. No matter how spasmodic this travel is, and despite no notification of plans, the railway is always expected to be on the job.

A $1,000,000 Transportation Line Built to Use Power Generated at Richmond

The acuteness of the railway situation is paralleled only by the demand for more power. The Naval Base alone is already taking 3000 kw. and 1500 kw. will be needed at the Quartermaster's Terminal. These demands are of course exclusive of the general increase in power requirements made on the company.

As the 12,000-kw. turbine at Norfolk was already up to capacity and no additional turbine capacity could be secured before 1920, the company has had to go to the extraordinary expedient of building a 66-mile, 110,000-volt transmission line from Richmond to Suffolk in order to transmit 15,000 kw. from its 20,000-kw. turbine at Richmond. This line will be constructed with Archbold-Brady A-frame and anchorage towers now under fabrication. Increased railway and power equipment totaling 15,000 kw. has also been ordered for the substations at Lambert's Point, Sewell's Point, Naval Base and Ocean View. A portable substation has also been in use on the Jamestown line for several years.

Automobiles, Inexperienced Labor and Other Accident Topics Discussed

Pacific Claim Agents' Association Takes Up Topics of Vital Current Interest at Its Portland Meeting—List of the New Officers Elected for the Ensuing Year

THE ninth annual convention of the Pacific Claim Agents' Association was held at the Portland Hotel, Portland, Ore., on May 1, 2 and 3. President H. K. Relf, Spokane, Portland & Seattle Railway, called the meeting to order on May 1 and in his annual address explained that the meeting last year had been postponed because the country had just entered the war, but the consensus of opinion this year was favorable to the holding of a meeting. He also said that the Director General of Railroads had approved until further notice the retention of membership in the association by claim agents of steam railroads. At the close of the meeting the following were elected officers for the ensuing year:

President, H. G. Winsor, superintendent of investigation and adjustments, Tacoma Railway & Power Company.

First vice-president, W. H. Moore, claim agent San Diego Electric Railway.

Second vice-president, J. S. Mills, claim agent Oakland Traction Company.

Third vice-president, C. A. Blackburn, claim agent Butte Electric Railway.

Secretary-treasurer, B. F. Boynton, claim agent Portland Railway, Light & Power Company.

Executive Committee: J. H. Handlon, San Francisco; A. M. Lee, Seattle; Thomas G. Aston, Spokane; J. T. Rupli, Seattle; F. J. Lonergan, Portland.

The next convention will be held at Oakland, Cal., at a date not yet set. The papers by Mr. Lee and Mr. Handlon were read by title only because neither of them was in attendance at the meeting. Abstracts of the papers which were presented are given on this and the following pages.

Accident Prevention Work

Due to the Prevailing Shortage of Competent Help Safety Work Is Lagging, Although the Need for It Is Greater Now than Ever Before

BY B. F. BOYNTON

Claim Agent Portland Railway, Light & Power Company, Portland, Ore.

THE accomplishment of much along accident prevention is very important just at the present time because so many of our old and tried men are leaving us to join the ranks and in the new material we are working with we have very young men and men along in years, and while I am satisfied they are doing the best they can, the results we obtained are not satisfactory.

In correspondence I have had with various companies, North, South, East and West, I find that the conditions are alike everywhere. Some of the big properties have discontinued most of their safety work and others have stopped it entirely. This I feel, is a great mistake as with the increasing number of automobiles and the inefficiency of the type of men we are having to handle our cars, we are really facing the most serious problem that has come to the claim agent in many years. On our own property we are still working along safety lines as best we can by lecturing our men before they are put to work, and also having frequent talks with them at the various carhouses, and we are posting safety bulletins which we receive from the National Safety Council. I think these bulletins are a great help. I feel we should continue to do the best we can and get the real old-timers who are too old to go to the front to continue to hammer away, and that we should continually place before the men anything we feel would be something that would set them thinking along safety lines, but I can find no organization either East or West that is putting forth any new ideas relative to safety protection.

I intended including in this paper what was being done in caring for street traffic along safety lines, but as Mr. Coffin, of our Public Safety Commission, has been kind enough to write a paper relative to the commission and its government of traffic on the streets, I have eliminated that part of it from my paper.

Old and New Employees

How to Obtain Co-operation from Both Under Present Conditions—Serious Increase in Accidents as a Result of Constantly Changing Personnel

BY H. G. WINSOR

Superintendent of Investigation and Adjustments, Tacoma Railway & Power Company, Tacoma, Wash.

THIS country has at present approximately 30 per cent of its man power actively engaged in work demanded by the government in connection with the war, and it is estimated that if the war continues another year, more than half of the man power of the United States will be employed in this manner. This abnormal condition affects our companies unfavorably in two ways: disorganization caused by enlistments and conscription and the advantages in seeking other employment where wages are much higher. We are eager to provide our share of men for the army, but not so willing to see our best men, many of whom have been in our service many years, leave their positions because they find it is difficult to pay living expenses on the most liberal wage that our properties can offer from the revenue secured on a 5-cent fare basis.

Owing to the demands of the war on the man power of the country, the personnel of all business institutions has changed or must soon do so. We can no longer depend on the young men as a potential factor in civilian endeavor and must turn to the man of middle age for the foundation of our organizations. This condition is at once a help and a hindrance in our reorganization work, a help because many of our most

reliable employees are men who have been long in our service and make a splendid nucleus on which to build; a hindrance because men of this age who have been accustomed to other kinds of work do not as a rule like either the working conditions or the discipline to which they are subject while employed by a transportation company.

If the subject of this paper can be answered it means the successful operation of our companies, but if an answer cannot be given, it indicates a very serious condition. I will consider the last phase of the subject first and will consider men employed continuously for a period of two years as old employees.

The Old Men in Service

A fair understanding of the responsibility which both employee and employer should assume in bringing about co-operative efficiency in our organization is important and generally understood by the older employees. Their knowledge and experience is a value to the companies which should receive just compensation. Their being in the minority should not deprive them of their rights to preference earned by faithful service. Their counsel and advice should be frankly sought in solving the unusual problems which now have to be solved. The importance of this cannot be too strongly emphasized.

Unjust criticism and ill-advised censure must be studiously avoided, and the company official should bear in mind the fact that the operation of a transportation company under present conditions brings just as many unusual difficulties to the employee as to the employer. We should not expect our older employees to act any differently as regards changed conditions than we do ourselves. How many of us are there who, under the strain of increased requirements of services to be given in many ways, coupled with steadily increasing demands for compensation, do not at times lose our poise? One of the dangers which should be avoided is to think only of our own troubles.

In my opinion a very large per cent of the old employees can be depended upon to maintain a co-operative spirit in their work even under conditions which reduce to a minimum the opportunity. While many of our old and reliable employees are leaving the service the cause is in most cases a desire to increase the income to meet the higher costs of living and not because of dissatisfaction with operating conditions.

The New Employee

In discussing this subject it will be necessary briefly to review the changed conditions brought about by our entry into the war, so far as it affects the personnel of our men. The demand for labor has increased many fold, and with the demand came a natural increase in the value of labor as well as its product. In every line of industry except public utilities these increased values were compensated for by increased prices of products or service, and while, in many instances, wages of men employed by public utilities have been materially increased, the increase has not kept pace with other industries because of our inability to secure increased revenue. In consequence, the type of men applying for work has been more and more unsatisfactory, and many companies have found it impossible to operate cars that were needed because of an insufficient number of competent platform men. This causes criticism by the public, which while demanding more efficient service strongly opposes any increase in fares.

Under such conditions the efforts made to secure co-operation in accident prevention must be planned on the basis of an entirely new condition of operation. Together with the changes brought about by war conditions many of our employees are now organized as labor unions, a majority of the members being new employees who do not appreciate the importance of accident prevention or the close co-operation which should always be maintained between the operating and claim departments. They can see no particular benefit in the smoker or other forms of "get-together meetings" which have been productive of so much good, and their general attitude in a majority of cases is opposed to the spirit of co-operative effort. To overcome this condition both the claim department and operating officials are placed in a position which calls for much thought and diplomatic administration.

As an example of present-day conditions the following may be of interest: During the first three months of this year, the number leaving and entering the service of our company at Tacoma was 42 per cent of the total number employed. During the same period, as compared to the first three months of 1917, car collisions increased 154 per cent, car and vehicle collisions 95 per cent and collisions with pedestrians 142 per cent. A careful investigation of the cause of this increase reveals the fact that inexperience and misunderstanding contributed in a large measure.

Shall we assume that conditions are such that we are powerless to correct the fault? Shall we plead that war conditions are wholly responsible? Not if we expect to maintain good standing in our profession. We must find a solution, and the suggestions which I am about to make are only intended to point to a remedy which is not difficult of application and which if persistently applied should bring about an improvement. This remedy is education.

We can hardly expect a man who has never had experience in operating a street car to understand all of

Accident Prevention Is a Patriotic Duty

Our officials have endeavored to impress upon the minds of all of our employees the fact that accident prevention is a real patriotic duty, that the conservation of men is one of the fundamental principles which must apply in winning the war, and that the closest co-operation between all departments and individuals in the service is imperative in bringing about satisfactory results. And finally we apply a kindly word of admonition instead of a sharp rebuke to those who appear to be slackers in safety work, only applying disciplinary measures when this method fails. We believe good results are being obtained and that perseverance will in a measure bring satisfactory results. H. G. WINSOR.

the many details in connection with his work, nor can we reasonably expect that any ordinary man can absorb all of the instruction which he receives at once. Our organization has increased its force of instructors and has applied more comprehensive methods in following up the work done by new men. Our officials have endeavored to impress upon the minds of all of our employees the fact that accident prevention is a real patriotic duty, that the conservation of men is one of the fundamental principles which must apply in winning the war, and that the closest co-operation between all departments and individuals in the service is imperative in bringing about satisfactory results. And finally we apply a kindly word of admonition instead of a sharp rebuke to those who appear to be slackers in safety work, only applying disciplinary measures when this method fails.

We believe good results are being obtained and that perseverance will in a measure bring satisfactory results.

All employees should be encouraged to consult company officials regarding their troubles. They should also be made to feel that any suggestions offered for the good of the service will receive proper consideration and that the company appreciates the interest shown.

The principles involved are as old as time and there is nothing new in application except this—the demands of the times make it imperative that every patriotic citizen do his utmost to conserve this nation's resources.

The Value of Courtesy

The Claim Department Is in a Position Particularly to See Its Importance—In the Event of an Accident Courtesy Has Financial Value

BY F. M. HAMILTON

Superintendent Department of Accident Investigation, Puget Sound Traction, Light & Power Company

MUCH has been said and written concerning courtesy, but it remained for a committee appointed by President Williams of the B. R. T. to place an actual cash value upon this polite and agreeable virtue, for in the report of this committee covering ways and means to offset the rapidly increasing cost of operation they place at the very beginning of the transportation department this item, "Greater Courtesy by Train Employees."

I have no doubt but that every member here present could suggest many ways in which the constant application of this principle would result in great saving of time, which—in the transportation business—is always the equivalent of money.

Courtesy has a maximum value in the transportation business because it is the lubricant which makes it possible to rub elbows with our fellow men without friction, and since the platform men and particularly the conductors of urban and interurban trains are constantly in contact with the public, it is of the utmost importance that these employees in particular be taught to be courteous to the passengers in their charge under any and all circumstances. And although I am not prepared to recommend the general adoption of a cut and dried courtesy code, such as is now in effect on some lines, I do believe that no opportunity should be missed to bring this important matter to the attention of trainmen in every way possible, by bulletins, by daily reminders, by official talks, etc. However, unless the employees are made to realize that courtesy is a big item in that often not clearly definable thing known as "company policy," they are not likely to give it the important place in their daily work which it deserves.

Courtesy in its application to a public utility has a distinct value to the trainman, the company and the public: To the trainman, because it gives him the respect and co-operation of his passengers, and it is a well-known fact that a good-natured crowd can be handled quicker and safer than an ill-humored one; to the company, because it is weighed in the balance of public opinion, which in most cases is formed from a personal appraisal of its servants—the approval or disapproval of the treatment rendered by employees. The courteous man benefits those he comes in contact with by the sheer force of example, and the Bible statement that a "soft answer turneth away wrath" is literally true, and in no company section can this be better illustrated and proved than in the claim department. Let us always bear in mind that courtesy after all is but the exemplification of the Golden Rule.

I daresay that the experience of every one of you has been identical with mine, and that in taking up with claimants or their friends the matter of adjustment, the fact that they have received kind and courteous treatment by the motorman and conductor materially aids in effecting an amicable and satisfactory settlement, while discourtesy and neglect are remembered long after the pain and injury arising from the accident are forgotten. And I know of several instances where claimants have rushed to attorneys for practically no other reason than resentfulness of treatment accorded by crews. If we are right, we can afford to be courteous; if we are wrong, we cannot afford not to be.

We all know and we are ready to grant that the platform man has much to contend with and that he daily and hourly faces a multitude of people with a multitude of trying dispositions. But that is an integral part of his day's work, and he must accept it along with early and late hours, eating his lunch on the run, etc., and it should be thoroughly impressed upon him from the time he first meets the employing official that he must

Courtesy Must be Shown

Everyone having to do with the investigation of claims should be doubly courteous, for often we have to make up for the failure of some other employees to be courteous in the first instance. Always we must remember that the good-will of the public is of vital importance to our companies, and since we are ever ready to settle promptly every meritorious claim we should be able to reject the ones for which we are not liable without offense, even though we cause disappointment. Some people seem to be of the opinion that courtesy is not consistent with firmness, but they are badly mistaken, for only with courtesy is firmness to be distinguished from stubbornness. F. M. HAMILTON.

be courteous under any and all circumstances. Now, I am not overlooking the matter of individual temperament or disposition, and the fact that some people are smiling and courteous by nature; that some are polite only when the mood is upon them; and that some belong to the "human crab" type; but these personal attributes should be apparent to the superintendent of employment, and the last class should never be even considered for service requiring close personal contact with the public.

So far I have only dealt with our subject in a general way—or in its direct application to employees coming in close contact with the public. But what about us of the claim department, whose special business it is to investigate accidents and occurrences out of which claims for injury and damage have been presented, or may arise? Are we ourselves alive to the importance of courtesy, and do we apply it to every detail of our business, or are we courteous only in the handling of claims wherein settlement has been determined upon, and neglect being as careful and courteous in explaining our reasons for declining. Everyone having to do with the investigation of claims should be doubly courteous, for often you have to make up for the failure of some other employees to be courteous in the first instance. Always we must remember that the good-will of the public is of vital importance to our companies, and since we are ever ready to promptly settle every meritorious claim we should be able to reject the ones for which we are not liable without offense, even though we cause disappointment. Some people seem to be of the opinion that courtesy is not consistent with firmness, but they are badly mistaken for only with courtesy is firmness to be distinguished from stubbornness.

How a Municipality Teaches Safety

The Work of the Portland Public Safety Commission Is Described—Through Its Efforts Accidents Were Reduced by Half

BY H. P. COFFIN
Executive Secretary and Manager of the Commission

A PUBLIC SAFETY COMMISSION properly organized is an assurance policy in the hands of a law-abiding community against traffic violations, excessive speeding and accidents. It differs diametrically from an insurance policy in that it treats with present existing conditions and not the promises to pay of the unfortunate future. It represents primarily an effort to achieve uniformity of action in the field of public safety through the power of a wider public opinion awakened through education, corrective measures and a realization of what constitutes true conservation.

About three years ago this city had an epidemic of autophobia, which had a tendency to terminate in violato-paresis. Finally the Mayor called together a number of influential citizens to study the situation and make recommendations to reduce the hazard. Out of this sprang into existence the Public Safety Commission of Portland which has in this brief period established a national reputation in the results which it has accomplished.

In three years the number of motor vehicles have increased in this State from 23,581 to 50,800. Last year through the work of the commission the accidents were cut in half. Twenty-eight citizens were killed and 846 injured, a large percentage of these injuries slight. In comparison with other cities of this size and taking into consideration our short blocks and narrow thoroughfares, this is much below the average.

During the period of the commission's existence it has standardized the traffic regulations, established uniform signs and signals, perfected the fire drill in the public schools, materially assisted in reducing the fire hazard, introduced into the ordinance the near-side stop of the street car, and the regulation of the jitney. It has secured the centralization of authority over traffic by a designated captain who gives his entire time under normal conditions to this work, initiated a survey of traffic conditions and submitted an elaborate report to the Council with recommendations for the betterment of traffic. Thirty thousand school children have listened to the story of "safety first," with the surprising result that for three months following this campaign not one child of school age was injured in an auto or street car accident.

The commission has also partially fitted out and encouraged the police through uniformed officers to carry on this work through the medium of screen pictures, talks and concrete examples of carelessness which have been shown to you.

19,000 COMPLAINTS IN THREE YEARS

In the three years that the commission has been active, more than 19,000 complaints have been received and registered covering every kind of traffic violation and accident. This record is maintained in our office at police headquarters for the convenience of the police bureau and the judge of the municipal court.

The good accomplished by the commission has at last been recognized by the city through an ordinance introduced in the Council by the Mayor giving the commission added authority and power which will undoubtedly enlarge its usefulness to the community.

Now that we have a centralized bureau for the handling of traffic, it is our duty to co-operate with the captain in charge by making from time to time surveys and inspections, followed by a vigorous safety campaign among drivers and pedestrians, a full investigation of accidents as a preventive measure, a prosecution of chronic and flagrant offenders and finally, but not the least, the establishment of a bureau for the examination and licensing of auto drivers and their registration at police headquarters for the recording of violations and accidents. Thus keeping in close touch with the traffic, the commission is in position to make unbiased and practical suggestions for the benefit of the whole community and lends encouragement to the police in law enforcement. We have been encouraged by citizens advising us of their experiences in other cities with traffic conditions, complimenting us by a favorable comparison.

We have very little opposition in our work. It's only the malicious and ignorant that respond with "Bunk" when safety first is preached. Our people now realize its importance and appreciate the lack of co-ordination in the past.

Employment of Women in Railway Work

How It Will Affect the Claim Department—Experience in New York, Brooklyn and St. Louis Indicates They Are Well Qualified for Railway Work

BY THOMAS G. ASTON
Claim Agent, The Washington Water Power Company, Spokane, Wash.

RAILROADS, both electric and steam, have employed women in some branches, and the number of branches in which they are employed is gradually increasing. The question for us to consider is what effect this employment of women in electric railway work will have on the work of the claim department. There is little precedent on the subject which can be used as a guide.

It is always to the advantage of the claim department to have all persons engaged in railroad service absolutely loyal and undivided in their support of the company for which they are working, and one of the first questions that arise is whether men and women will work in harmony in this class of work. Where there is the union and the union rules will not recognize women, opposition by the men on this ground will have to be met. Where the open shop rule prevails, undoubtedly the union men on the railroad will be slow to aid the incoming woman. Then, there is the general antagonism on the part of many men against the introduction of women in any line of life or work that heretofore has been peculiarly the field of man. It is like the opposition of man to woman suffrage and to the work of clerks, stenographers and bookkeepers now commonly done by women with no thought of the propriety or impropriety or anything except of the physical and mental fitness for the job.

In Brooklyn and New York, the Central Labor Union protested to the Public Service Commission against the employment of women on electric railways, but the commission responded that it had no power to exclude any applicant from employment by reason of sex.

Information has been received that in one city where women conductors have been employed, there was a disposition on the part of the men to start the cars without signal from the women conductors and it is the belief of the employer that this was done deliberately. Whether or not unionism had anything to do with this, the information does not state. There do not seem to be any reported cases showing opposition to employment of women other than that furthered by unions as reported herein. In Italy, France and Great Britain, women have been very generally employed in this work and the general public not only in the United States but also in Europe received the introduction of women in this work with much favor.

To learn the experience of people in the United States, a circular letter, containing the following questions, was sent to ten companies operating street cars:

1. What has been your experience in regard to the reduction or increase of accidents since you began to employ women?
2. What effect has it had upon the public—are they antagonistic or favorable toward employing women?
3. Have you found that disorderly passengers have taken advantage of the fact that women instead of men are operating your cars?
4. How do they conduct themselves at the scene of an accident?
5. How do they respond to an emergency?
6. What success do they have in getting information and securing witnesses at the scene of an accident?
7. Have you or have you not found them sympathetic with the injured party to the extent of admitting liability?

The responses brought the information that New York, Brooklyn and St. Louis are the only places where women are employed in this work. From New York and Brooklyn we are told that accidents have not increased, that the public seems favorable toward women conductors, that disorderly passengers have taken no advantage of the fact that women were used instead of men, that women conduct themselves very well at the scene of an accident, that they respond fairly well to an emergency, that their reports of accidents and the securing of witnesses seem as adequate as those of the men, that they have not been found sympathetic to the extent of admitting liability. From St. Louis, Mo., we learn that the general public was favorable toward employing women, but the Central Trades & Labor Council and its members were against it, that disorderly passengers have not taken advantage of the fact that women were operating the cars, and that they conduct themselves in an agreeable manner at the scene of an accident.

Women Operators Will Succeed

It is my opinion that because of the simplicity of operation of electric street cars in the United States, women can be as successful as drivers and conductors as men. It is a well-known fact that women become expert chauffeurs and show quickness of thought and excellent judgment in emergencies in the operation of automobiles. It certainly would not be any harder for a woman to drive a street car than it is to drive a large high-power automobile. Experience shows that women drivers of automobiles do not have as many accidents in proportion to the number of drivers as do men. The experience is the same in connection with the operation of elevators. It can be admitted that women are of a more nervous temperament than men, but it is also admitted that women are more cautious and are less reckless than men. It is the general opinion that they may become excitable and lose control of the machine when contending with congested traffic conditions. The correctness of this view is challenged. They are not so likely to take a chance, and the taking of chances is accountable for a great many accidents.

—THOMAS G. ASTON.

WOMEN WELL FITTED FOR THE WORK

The rapid growth of commercialism in this country has given to women positions which were formerly occupied by men. The hesitation and timidity that formerly possessed women when seeking employment away from the home is passing away. Men and women commingle and work together in many branches of industry. In all work, not requiring physical strength, they become as efficient as men. It is the opinion of the writer of this article, that because of the simplicity of operation of electric street cars in the United States,

women can be as successful as drivers and conductors as men. It is a well-known fact that women become expert chauffeurs and show quickness of thought and excellent judgment in emergencies in the operation of automobiles. It certainly would not be any harder for a woman to drive a street car than it is to drive a large high-power automobile. Experience shows that women drivers of automobiles do not have as many accidents in proportion to the number of drivers as do men. The experience is the same in connection with the operation of elevators. It can be admitted that women are of a more nervous temperament than men, but it is also admitted that women are more cautious and are less reckless than men. It is the general opinion that they may become excitable and lose control of the machine when contending with congested traffic conditions. The correctness of this view is challenged. They are not so apt to take a chance, and the taking of chances is accountable for a great many accidents.

It may be that the time will come in this country when we will need to employ women in the mechanical departments of steam and electric lines. A long war may force this necessity upon us. If that time does come, there seems to be no good reason why women cannot fill the positions except where great physical strength is required. In view of the various mechanical devices for lifting heavy articles which are used in all well-equipped shops, it would seem to be an unusual circumstance that would require more strength than women possess.

Venturing an opinion on this subject, I would say that women can successfully perform not only the duties of motormen and conductors but also most of the work in the mechanical department now done by men.

Prevention of Automobile Accidents

Driver Usually Is to Blame but He Should Be Taught to Exercise Greater Care—Safety First Efforts of Motormen Effects 33⅓ Per Cent Reduction in Accidents

BY W. H. MOORE
Claim Agent, San Diego (Cal.) Electric Railway

CAUSES given for automobile accidents embrace almost every excuse that can be in any way connected with an automobile or street car, but the underlying cause of most accidents is carelessness on part of the driver of the automobile. In fact, the records show that he is responsible for 90 per cent of them.

In justice to him we must remember that the number of automobiles in use greatly exceeds the number of street cars. We must also consider that the driver of an automobile holds a decided advantage in the way of prevention, on account of being able to change his course at any time and because he is reminded of the presence of street cars by tracks upon which they run. The difference in favor of the motorman is largely due to the systematic training which he has received in being taught the necessity of attending strictly to his duties so that no careless act of his may cause an accident. By its system of training, accidents of all kinds on the San Diego Electric Railway for 1917 were reduced 33⅓ per cent below those of the preceding year, with the same number of cars operated, while the number of automobiles greatly increased.

If auto drivers knew something of the distance required to bring a heavy street car to a stop under various conditions it would go a long way toward discouraging the practice of autoists stopping upon car tracks in advance of approaching cars with a feeling of security that the street car must stop for them. The average automobile driver may have a thorough knowledge of his car but knows little or nothing of the control of a street car or railway train. No doubt, the majority if not all members of the Pacific Claim Agents' Association drive automobiles, but it is safe to say that none of you take any chances by driving upon car tracks in advance of cars approaching at high speed, because the danger to you is apparent on account of your knowledge of the control of the street car, while perhaps the thought has never occurred to your brother autoists.

Safety first should also be taught in the public schools as a permanent branch of the common school education. The lessons could be worked out in a practical manner and entered in the text-books graduated to suit the different grades of the schools. The object in attending school is to acquire knowledge and store it away for future use, and it is just as essential to the future welfare of a child that he be trained in the art of protecting life and limb as to be able to name the wild animals that inhabit a foreign country. The safety-first training now carried on in the public schools has no doubt accomplished a great deal of good, but the plan just described would be more thorough as well as productive of more lasting results.

As a farther prevention of automobile accidents there should be a uniform set of simple traffic rules in all Pacific Coast States, and, one of the most important clauses in such a law should be to make it a misdemeanor for a person carelessly to cause a hazard of accident. Such a clause would be warranted because a person who carelessly causes a hazard is equally guilty with the person who has caused an accident, because if an accident was averted it was not due to any care of good judgment on part of the party causing the hazard, but owing to circumstances or the presence of mind and quick action on the part of some other person. Such a law would also discourage the beginner from driving into the congested district of the city before he became proficient in the operation of his car. If the motorman of a street car knowingly indulges in carelessness to the extent of jeopardizing the safety of others, he is quickly deprived of his right to operate a car, and there is no reason why the heedless automobile driver should not suffer the same fate.

We have traffic laws, but to enforce them seems a difficult problem. One plan would be to have a certain number of the police in each city assigned exclusively to safety duty. This would give such officers ample opportunity for the enforcement of traffic rules and at the same time they would be unable to wink at violations of the law under the pretext of attending to other duties. If they did so their neglect would become so apparent that they would soon be called to account. There should also be a traffic ordinance in every city, giving the street car the right of way at street intersections. Such a law is warranted for the safety and convenience of the public, if for no other reason. As a farther prevention of automobile accidents every

motor propelled vehicle should be compelled to carry a sign inside the dash in a conspicuous place containing at least a dozen of the most important rules for the prevention of accidents. As a sample of such rules "Look both ways for approaching cars before driving upon car tracks," could be used. These words would soon become so firmly impressed upon the minds of the drivers that when a driver approached a railway track the subconscious thought would assert itself and prompt him to look before driving across.

Written Discussion on Mr. Moore's Paper

BY J. S. MILLS
Claim Agent, San Francisco-Oakland Terminal Railways

IT IS NOT my understanding that the object of this discussion is to find out what to do for ourselves so much as to find out how to obtain co-operation from automobile owners and drivers. Personally, I am very skeptical of any method which depends upon persuasion for its effectiveness. Education by way of illustrated pamphlets and newspapers is helpful to thoughtful people, but they give the least trouble. It is the thoughtless and reckless drivers whom we want to reach and no amount of literature seems to have the least effect upon them. To them, the much abused slogan "Safety First" is merely a catch phrase. It has no meaning.

The increasing number of automobile accidents clearly indicates the necessity for action along more effective lines than have been proposed by Mr. Moore.

Necessity always provides a remedy, and no great reform was ever brought about until the people were made to see the necessity for it, after which laws were promptly made to meet the demand. For example, the need for safety appliances in shops and factories and better railroad equipment was recognized and a considerable agitation of the subject was necessary to arouse the people, but the ever-increasing number of workmen minus fingers, arms and legs finally resulted in the passage of laws which enforced their installation. It was the same when the care of injured workmen was recognized as an unjust burden on charitable institutions and some form of insurance was demanded that commissions were appointed to investigate and their reports resulted in the adoption of workmen's compensation and insurance laws.

At the present time great numbers of people are being killed and injured by automobiles whose owners have no property other than the machine, and oftentimes only a small interest in that. In consequence, the dependents of the killed have no recourse at law, the injured must pay their own bills, and if unable to do so become burdens on the communities in which they live. In this situation the only remedy would seem to be the addition of a clause to existing state motor vehicle laws, making insurance against personal injuries compulsory. We are not entirely without experience in the workings of such laws, for when the "jitney disease" was at its height, city ordinances provided that a certain amount of insurance must be carried fully to protect passengers in the event of injury.

I am thoroughly convinced that if automobilists were compelled to carry insurance covering personal injuries, nearly all the reforms desired would soon be accomplished, among them the much desired examination and training of operators in the same manner as is now practiced by street car companies in the selection and training of motormen.

Moving Drafted Men Via Electric

Government Accepts Electric Railway War Board's Offer of Facilities—Work Will Be Nation-Wide

HENCEFORTH, as rapidly as the plan can be extended over the country, the transportation of drafted men for the United States Army will be carried on by electric railways. This is the result of a tender of such facilities by the War Board for the relief of the congestion on steam railroads.

After negotiations with government officials, it has been arranged that all drafted men will move by electric lines from the territories served by them direct to the different camps. If no through electric routes are available, the electric lines will be used to convenient junction points with steam railroads, provided the facilities of the electric lines are adequate to afford the services required for the entire movements and provided the steam trains later used do not originate at the same points as the electric trains.

The War Board has been requested by the official in charge of draftees to give information pertaining to the ability of electric lines to handle movements, prior to the issuance of government orders. Consequently the board is urging companies to furnish the data needed, such as schedules, maps and other traffic information for the preparation of itineraries if these are called for.

The compilation of such information is already under way for three states, Ohio, Michigan and Indiana. C. J. Laney, W. S. Rodgers and F. D. Norveil, representing the electric lines in these states, have been in Washington, and their surveys of the possible use of the electric lines are as follows:

A check of the drafted men to move on June 24-29 from Ohio county seats to Camp Sherman at Chillicothe shows that out of 800 men the interurbans can handle at least 50 per cent. The electric lines can move men from fifty-five counties out of a total of eighty-eight. The general movement will be as far as Columbus, since the interurban line from Columbus to Chillicothe is third-rail and cannot interchange cars with the other lines entering Columbus.

In Michigan out of a total of 7000 draftees to be moved at the end of June the electric lines can handle 4795 men in a period of five days.

From Indiana 1000 drafted men must be moved on June 24-26 to Camp Sherman. A large number can be handled to great advantage by the electric lines, and these will agree to carry from 45 to 50 per cent of the men over a five-day period. Delivery will be made to steam railroad connections.

The shipbuilders of the Bay Cities, California, had a riveting contest as a feature of their picnic at Idora Park, Sunday, June 19. Through the courtesy of the San Francisco-Oakland Terminal Railways, the pneumatic transfer compressed air battery of six 11-ft. compressors was loaned to furnish the driving power.

No Abnormal Tax Increase from Rapid Transit

Shifting of Population and Values in Other Sections Neutralizes Increase in Assessed Valuations in Districts Immediately Served

THE report of the Department of City Transit, Philadelphia, Pa., for the calendar year 1916 contains as one of its parts a noteworthy discussion of the effect of rapid transit construction upon real estate values and taxation. The report in general is a detailed statement of the negotiations and the engineering work for city-built rapid transit lines in Philadelphia from the time William S. Twining assumed the directorship of the department in February, 1916, up to the end of that year.

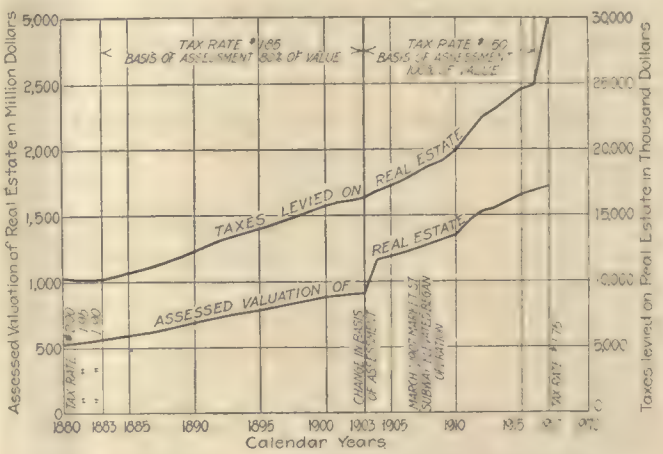
The report explains that prior to that time no final contracts had been drawn. The Department of City Transit had leaned toward a uniform 5-cent fare, with any city deficits to be borne by the general tax revenues. With Mr. Twining's advent recommendations were made



COMPARISON OF INCREASES IN ASSESSED VALUATIONS BY SECTIONS IN PHILADELPHIA

in regard to changes in the construction schedule the unification of the city's and the company's systems, and a flexible fare meeting the cost of service. The report describes in detail how a substantial foundation was laid during 1916 for the building of an acceptable contract for the operation of the new lines by the Philadelphia Rapid Transit Company—a development which has now reached its final stage.

In the course of his report Mr. Twining mentions how he took exception to the premises formerly held by the municipality—namely, that the expansion of a city, due to rapid transit lines, will increase abnormally the total assessed value of the city's real estate; that its tax revenues will thus be abnormally increased, and that this abnormal increase should be available for meeting city deficits arising from the building and the operation of the rapid transit lines. In Mr. Twining's opinion, rapid transit lines are unquestionably an indispensable factor in developing suburban real estate, but it has never been proved that such development produces an abnormal increase in the total assessed valuation of a city. It undoubtedly produces a large increase in the districts immediately served by the rapid transit lines, but the shifting of population and values in other parts of the city which results from the building of these lines, largely neutralizes this increase. As a result, no abnormal increase can be detected in the assessed valuation of the property in the city when awarded as a whole.



ASSESSED VALUATION AND TAXES ON REAL ESTATE IN PHILADELPHIA

As tending to confirm this statement, Mr. Twining introduces in his report the accompanying diagram and map showing the assessed valuation in Philadelphia over a period of years. It will be noted, he says, that there is no abnormal increase to be detected due to the opening of the Market Street subway and elevated, which occurred in 1907. The assessed valuations of the city's real estate show a fairly uniform increase year by year. Some sections of the city show large increases and some are stationary or show a decrease. Mr. Twining does not dispute that a large increase in the assessed value of real estate in West Philadelphia took place following the building of the Market Street line. In considering the tax revenues of the city as a whole, however, he can detect no abnormal increase attributable to rapid transit.

In short, Mr. Twining thinks it a false assumption that an abnormal increase in tax revenue will be created as a result of building and operating rapid transit lines, and that without an increase of tax rates there will be a surplus of tax revenue available for meeting deficits. This assumes that there is a profit to a city resulting from its current taxes, whereas it is usually described as operating at cost, hence without profit.

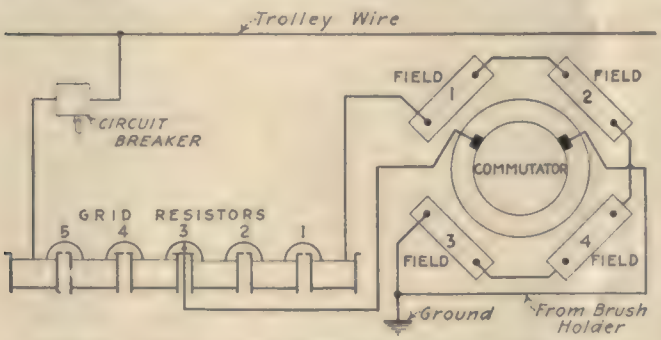
Using a Series Motor for Emergency Constant-Speed Work

Description of the Methods by Which the Fields Are Connected in Series With Resistance As a Shunt Across the Armature

BY F. J. FOOTE
Master Mechanic Ohio Electric Railway Company, Columbus, Ohio

IT IS FREQUENTLY very convenient to use a railway motor that is built for series operation for driving a machine or line shaft in a railway shop. In these cases it is nearly always desirable to operate the machine at as nearly constant speed as possible. It is well known that a series-wound motor will speed up when the load is light and slow down when the load increases, thus giving very unsatisfactory operation for many uses. It is, of course, possible to rewind the field coils so that the motor may be used as a shunt motor, and where it is to be used for an extended time this should be done for economic reasons.

However, for work that is more or less temporary the following arrangement has been found by the writer to give very satisfactory results, as the maximum of speed adjustment and the minimum of power consumption is secured thereby. The method consists in placing sufficient resistance in series with the fields to hold



SERIES MOTOR ARRANGED FOR CONSTANT-SPEED OPERATION

the current down to a safe value when connected directly across the line, and then connecting the armature across from the point on the resistance that gives the desired speed to ground.

An accompanying diagram shows the connections for a railway motor used recently for temporarily driving the stokers on a battery of boilers, while the stoker engines were being repaired. The sketch shows the fields and armature of a four-pole motor. The grid resistors used consisted of some sections from a car. Enough of these grid sections were used to reduce the current to something less than full load for the motor. The fourth field was connected to ground, the first field to the resistance, and the resistance was connected through a circuit breaker to the trolley wire. This made the field circuit complete.

To furnish the voltage for the armature the cables from the brush-holders were connected, one to ground, the other to some point along the resistance, such as 3. If this gave speed too low, the connection was changed to 4 or 5; and on the other hand, if the speed was too high, the connection was changed to 2 or 1, as needed.

Of course, there was a waste of energy in this arrangement, but being only temporary, it was decided that this would be less expensive than to rewind the fields for shunt operation. The writer has tried various plans for using series motors for constant speed work, but the one just described is the most convenient and flexible, and has proved to be the most satisfactory of any of them.

Angle-Iron Posts for Car Painter's Platform

IN THE paint shop of the Empire State Railroad, at Lake Junction, near Syracuse, N. Y., rows of posts like those shown in the illustrations are installed between tracks for the purpose of supporting planks from which the painters work. These posts are set a couple of feet in the concrete floor and extend about 7½ ft. above the floor. The posts are made of 2-in. x 2-in. x $\frac{3}{16}$-in. angles connected by 2-in. x ¼-in. flat steel pieces. These are riveted to the angles and are spaced on 15-in. centers from the bottom to the top of the posts. The brackets for the planks are also made up of angle iron of the same size as that used in the posts, the upper part of the bracket being 20 in. long. The back of the bracket is formed of a piece of flat steel, 2 in. wide, with the top bent over to form a hook. At the outer end the upper side of the horizontal angle is turned up to form a toe to prevent the planks from slipping off. The bracket is held in place by its own weight and is very easily moved. A typical steel city car from the Oswego division can be seen in the background in the lower picture.



CLOSE-UP VIEW OF BRACKET



ANGLE IRON POSTS IN LAKELAND PAINT SHOP, EMPIRE STATE RAILROAD

Substation Equipment for St. Paul's New Electrification

The Spokane River Hydraulic System Supplies Power to This Substation at 102,000 Volts, Using Three-Phase Alternating Current

THE substation equipment for the Columbia River division of the Chicago, Milwaukee & St. Paul Railway, now being electrified, will be similar to that used on the original Montana electrification of this railway. The modifications which will be made have been shown by experience to be desirable or necessitated by the difference in operating conditions.

Power for this division will be supplied in the form of three-phase, 60-cycle, 102,000-volt alternating current from the Spokane River hydroelectric system of the Washington Water Power Company. The high-tension line will parallel the railroad and, looping into the substations, will form the high-tension bus for each station. In the stations the current will be stepped down to 2300 volts and then transformed by motor-generator sets into 3000-volt direct current for train operation. There are to be three substations altogether, spaced approximately 30 miles apart and located at Taunton, Doris and Kittitas respectively. The equipment in each will be practically the same.

The incoming high-tension line will enter the substation through condenser-type bushings and will be controlled by a 3-pole Westinghouse type GA oil circuit breaker, arranged for remote mechanical operation and providing automatic protection against overloads and reverse power.

The transforming equipment is designed on the unit basis; that is, there will be a transformer for each motor-generator set, and no low-tension buses will be provided. The Taunton station will have two such units, to be immediately installed, giving it a capacity of 4000 kw., and the other two stations will each ultimately have three units, providing a capacity of 6000 kw. each.

The transformers will be of the oil-insulated, tubular, air-cooled, shell type, connected star-delta, with several full-capacity high-tension taps to provide the necessary flexibility. The normal capacity of each transformer will be 2500 kva., but they are especially arranged to carry the high overloads encountered in railway service. The ventilating ducts and the coils are vertical, so that the oil in absorbing heat from the coils flows upward in the natural direction, thus preventing the formation of hot spots under short-time heavy peak loads. Each transformer bank will have a type GA circuit breaker which provides overload protection.

The motor-generator sets will each consist of a 2800 hp., 2300-volt, 14-pole synchronous motor of 514 r.p.m., coupled to two 1000-kw., 1500-volt direct-current generators connected in series. Both the motor and the generators will be separately excited by means of direct-connected exciters.

The normal rating of the sets will be 2000 kw., but they are designed to carry 3000 kw. for two hours and 6000 kw. for five minutes. These very severe overload conditions make good commutation an absolute essential for satisfactory operation. As a 6-pole generator possesses inherently the best commutating characteristics and will handle excessive currents without flashing, this type was adopted for these sets. It is recognized, however, that a short-circuit on the direct-current line at or near the substation will result in currents that would ordinarily cause flashing, but special arrangements have been made that will suppress flashing even under these extreme circumstances. The method employed was fully described in the ELECTRIC RAILWAY JOURNAL of May 4, page 858.

Because of the use of regenerative braking by the locomotives, the generators will at times operate as motors. For this reason they will be shunt wound so as to avoid the difficulty of operating differentially-wound motors in parallel, and to obtain satisfactory division of a heavy regenerating load without careful attention on the part of the operators.

The load factor on these substations will be comparatively low, so that it is desirable to eliminate as many continuous losses as possible. An interesting means for accomplishing this result is the use of separate motor-driven blowers which are automatically started when the temperature of the motor-generator sets reaches a predetermined degree. During periods of light loads or short-time peaks, the motor-generators will operate well within safe temperature limits without forced ventilation, but when the loads are heavy the necessary ventilation will be provided. In this way the expense of operating the ventilating sets during light-load periods is avoided.

In order to provide maximum protection to the operators, the control of the 3000-volt direct current has been designed in accordance with high-tension alternating-current practice. The circuits will be completely separated; all breakers and switches will be controlled from a gallery above the operating board; and it will be possible to isolate the station from the railroad operating system by means of remote controlled switches in the feeder circuits which can be opened under load. The normal control of the outgoing feeders will, however, be by type GA circuit breakers with overload and reverse power protection. Electrolytic lightning arresters will be mounted on the roof of each of the substation buildings.

All the equipment for these stations is being supplied by the Westinghouse Electric & Manufacturing Company.

Convict Labor Rebuilds Power Plant

The United Gas & Electric Engineering Corporation has recently completed the rebuilding of a plant in Leavenworth, Kan. This work was carried on under difficult conditions as regards labor. The construction dragged very slowly until the Leavenworth company succeeded in obtaining permission from the Governor of Kansas to use labor from the State penitentiary at Lansing. The convicts were very glad to get a chance at work of this kind affording much more freedom and enjoyment than the humdrum prison life and it made the early completion of the work possible. In rebuilding the plant new equipment was installed consisting of stokers, boilers, a 1500-kw. turbine, a new concrete stack and a new condensing equipment consisting of a pumping pit in the river connected to the plant by 1500-ft. pipe lines.

AMERICAN ASSOCIATION NEWS

Jitneys Waste Man-Power

Letter from W. V. Hill of the War Board to General Crowder Says They Are Non-Essential

ON MAY 31, W. V. Hill, of the American Electric Railway War Board, wrote to Maj.-Gen. E. H. Crowder, Provost Marshal General of the Army at Washington, as follows:

Referring to your announcement with respect to amending the selective service regulations dealing with habitual idlers and men engaged in non-useful pursuits: In this connection I desire to call to your attention a class of men who are engaged in the so-called jitney-bus business. There are thousands of them most of whom are within the draft age operating these vehicles throughout the country in competition with electric railways, thus performing a duplicate and unnecessary service to the public. This service can and should be performed by the electric railways.

For illustration, take the situation in San Francisco, Cal.: There are approximately 500 jitneys operating on Market Street competing with the electric railway service for a distance of 3 or 4 miles, for they will not compete on long hauls. The car service is ample to handle all of the traffic, but as a result of the jitney competition the cars are obliged to operate with very light loads during most of the hours of the day.

It is therefore evident that the jitney is a non-essential, consuming large quantities of gasoline, rubber, steel, etc., as well as wasting man-power, for it will take the services of twelve men operating jitneys to perform the service of transporting the number of passengers occupying the seats of one street car which requires two men to operate.

On the other hand, some of the electric railways of the country have furnished as high as 40 per cent of their trainmen to the government under the selective draft act. The result is, they are confronted with a very serious problem of furnshing ample transportation facilities to shipyards, plants and industries engaged in manufacturing war materials—all of which are very essential to the proper conduct of the war.

The electric railways, unlike many other industries, have derived very little benefit by reason of the war, for the increased cost of operations, both in labor and materials, have placed these properties in serious financial condition, and state and municipal authorities have been slow to respond to their appeal for increased fares. This in brief is our situation.

We therefore trust you will give careful consideration to the foregoing, as it is an important factor to our government, depending upon us to keep open the arteries of transportation as indicated above.

Bulletin on Housing Law

THE American Electric Railway War Board has issued Bulletin No. 25 giving the text of the federal housing act, approved on May 16, under which the President is authorized to purchase, acquire by lease, construct, requisition or condemn electric railways if needed to provide housing for war workers.

Support for the War Board

A REFERENCE was made last week to a circular letter on the work being carried on by the War Board in Washington sent by the American Electric Railway Association to those companies which have not yet contributed to its support. The explanation is made in this letter that it has been the policy of the board since its inception to represent all of the electric railways individually and collectively and not simply the members of the association, so that it is being sent to all companies. The members of the board serve without compensation, but certain expenses are inevitable, such as office rent, collection of data, etc. Each road is being asked to contribute in proportion to its gross income. So far 126 roads in the United States have contributed $23,275, but the time has come when additional revenues are needed.

Pamphlet on Freight Haulage

THE American Electric Railway Association has had reprinted in pamphlet form the article by A. B. Cole on freight haulage on electric railways, published in the issue of this paper for May 11, and is sending copies to members of the Chamber of Commerce of the United States and other commercial organizations as well as to a number of manufacturers. Additional copies can be secured from the association office at a price of 10 cents each.

Toledo Section Elects Officers

A MEETING of members of the joint section of the Toledo Railways & Light Company and associates at which officers for the coming year were elected was held on the evening of May 24. Interest in the election was very keen, the candidates for office having held a meeting on May 7 with the nominating committee to decide the manner in which the election should be conducted. After considerable discussion, it was decided that all those running for office should be provided with electioneering cards similar to those used by candidates for city offices, etc. In this way all prospective office holders were able to present their own reasons as to why they felt they were best qualified to fill the office for which they were running. As a consequence, it was no uncommon thing during the campaign to hear two rival candidates expounding their individual merits before different members of the joint section.

As a result of the interest felt in the election 250 members were present, and as the results were bulletined much good-natured bantering was evident. The officers elected were as follows:

Chairman, G. E. Snider, engineering department; vice-chairman, J. J. Duggan, Acme Power Company; financial secretary, J. L. Wright, electric meter department; treasurer, M. K. Thomen, engineering department; secretary, G. E. Lafferty, general office; members of executive committee, T. J. Nolan, H. Friede, and William Long.

To indicate the interest in the Toledo Section, it is worthy of mention that on May 24, 1917, the beginning of the first joint section year, there were 335 members. On Jan. 1, 1918, there were 292 members, and on May 24, 374 members. From May 24, 1917, to May 24, 1918, 159 members were dropped from the rolls due to the draft, enlistments, and other reasons, but during the same period 194 employees applied for membership, so that had the war conditions not come the section would probably now have 500 members. Eighty new members were admitted since the meeting of May 7.

Prior to the final result of the balloting a musical program, in charge of L. D. Scouten and F. M. Somerville, was rendered by the boys from the Starr Avenue carhouse. At the conclusion of the meeting a buffet lunch was served.

LETTERS TO THE EDITORS

Are Reconstructed Safety Cars Worth While?

THE SOUTHWESTERN ELECTRICAL & GAS ASSOCIATION

DALLAS, TEX., May 30, 1918.

To the Editors:

Several of our members are interested in the subject of changing ordinary single-truck, double motor two-men cars with hand brake equipment into front entrance one-man cars, and I would like to have some data showing whether such cars could be reconstructed into one-man safety cars with efficient results. There are many types of old cars whose design lends itself to such reconstruction, so far as the mere mechanical conditions are concerned, while there are other types with which such reconstruction is out of the question.

A recent survey of this matter throughout the Southwest has led me to the conclusion that it will eventually pay almost any street railway a better return to use the complete one-man safety car rather than the reconstructed car. Recent observation and information have pretty well demonstrated that the average old type, single-truck car weighs too much per passenger for economical rapid acceleration and retardation and that a 30-in. wheel necessitates not only higher steps, which tend to delay loading and unloading and to increase step accidents, but the additional height of the car from the track seems to add greatly to the "jerk" made during rapid acceleration and braking. So far as the safety devices for the doors, the "dead-man's handle" and the fare receiving and recording devices are concerned, these can be placed on any car and will probably be as efficient on one type as another.

The main factors in favor of the safety one-man car specially built for the purpose are its smaller weight per passenger capacity and the lessened distance of the car floor from the rail. The front entrance is, of course, a necessity both from the point of fare-taking and recording and also from the fact that the passengers entering and leaving are less liable to be injured by extremely rapid acceleration and retardation, the tendency of such being to aid in "welcoming the coming and speeding the parting passenger" and doing so in such a manner that he is not thrown backward in either case.

I have been enabled in two cases to watch the parallel operation on the same lines of a car specially built for this purpose and reconstructed cars, the safety one-man cars being used on regular schedule and the reconstructed cars as fillers-in during rush hours. A very close record shows that the passengers prefer the first type and that there is with this type a distinct difference in the time of acceleration and braking at each stop. Meters on all of these cars show a distinct and quite large saving of current used in favor of the car built specially for the purpose. The "reconstructed" cars in both these cases have really had nothing added to them except certain of the safety devices—not including the dead-man's handle. They were equipped with 30-in. wheels, one step to the platform and motors of ample capacity for their previous two-men operation, and they were of comparatively light weight for their passenger capacity

In these two cases the difference of economy of operation and satisfactory service to the public were so marked that it would seem to be unwise to reconstruct cars fully for safety one-man operation as under no conditions of traffic would they approach the "100 per cent service," which is possible with a car built specially for the purpose.

As this is an important matter with many of our members at the present moment, I would be very glad to have, from any of your readers who have tried reconstructing cars for this purpose, the operating and financial results obtained from a reconstructed car, as well as opinions as to the desirability of so doing.

H. S. COOPER, Secretary.

Use Auto Trucks With Flanged and Rubber Tires

CLEVELAND, OHIO, JUNE 7, 1918.

To the Editors:

The insufficiency of steam road terminals and the lack of equipment of electric interurbans brought into use last winter the auto truck for both short-haul and long-distance freight transportation. That the need of this departure was great and the service helpful, goes without saying. The cost, however, was terrific—first, in the economic waste of the small unit, second, in the destruction of miles of improved highways, and, third, in the millions that now must be spent in the repairs yet to be made.

It is no stretch of the imagination to say that for every dollar earned, $10 was either wasted or destroyed. Economic laws will eliminate the waste, but it is only improved service both in cost and time that will save the roads which otherwise must be destroyed in a short time.

As I see it, this can be brought about by the interurbans, and, at the same time, give to these struggling roads an increase of revenue which most of them so sorely need. How? By the interurbans entering the field not only as transporters of freight over the rail, but as deliverers of the same freight by auto truck when the end of the rail route is reached. To accomplish this all that needs to be done by the interurbans is to purchase auto trucks and equip these trucks with flanged wheels and couplers. When single trucks are to be used, couple them on to "locals;" when many are to be run, move them in trains. When the end of the rail route is reached, place on the wheels demountable rims with truck tires. The truck then will be ready for house to house delivery. By route-sorting the goods at the point of origination instead of at the destination, the labor necessary in loading and unloading will be saved. The cheapness of electrical rail movement is so great over that of a gasoline-propelled car operating on brick pavements that competition will be entirely out of the question.

The thought herein expressed came to me as I was driving over a new pavement completely destroyed last winter. I am submitting it to the operators of interurban properties for what it is worth.

PETER WITT.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Labor Hearing June 24

General Labor Principles Will Be Discussed Before Messrs. Taft and Walsh at Washington Session

A question of great importance to electric railways is to be argued in Washington on June 24 before Messrs. Taft and Walsh, joint chairmen of the Federal War Labor Board. This is on the point as to whether the lack of financial ability is to be considered a bar against the payment of higher wages to dissatisfied employees. In recent years several arbitration boards have held that employees are entitled to a proper standard of wages even though the employer may be able to show that financial disaster may result from taking on the additional burden. This is of particular interest to public utilities which are in the dilemma of not being able to raise the price of their product to meet the extra charges. In this connection, the board also has been asked to point a way out of the difficulty by suggesting measures of relief in the event that higher wage scales are established for any of the parties to the proceedings.

Cases Multiplied Rapidly

These developments are the result of controversies over wages for employees of the Detroit and Cleveland companies, and more recently for those working in Chicago, East St. Louis, Scranton, Newark, N. J., and Portland, Ore.

The Chicago hearing took place on June 12, after appeals to the board by employees of the Chicago Surface Lines, the Chicago Elevated Railways, the Chicago & West Towns and the Evanston (Ill.) Railway companies. The case of the Surface Lines was peculiar in that the company had not submitted to the jurisdiction of the board while the employees and the city, as partner in the net receipts, had done so. Attorney W. W. Gurley for the company referred to the fact that the present contract does not expire for two years and said that while the men might be entitled to more pay the financial condition of the company would not warrant such expenditure. He said that until the board could point a way out of the difficulty the Surface Lines would not agree to a joint submission.

A new point was presented by Attorney F. H. McCulloch for the Evanston Railway, who said there are no war industries in that city, and he did not see where the War Labor Board could assume jurisdiction. This company has usually followed the Surface Lines in fixing a wage scale, but the lawyer said if there is to be any submission he would insist on a separate hearing. Attorney Willard McEwen for the West Towns company did not make the same claim as to war industries, but he insisted on a separate hearing. The men are not seeking a change in working conditions in any of these cases, but they insist that even though the existing agreement has not expired the wage schedule does not meet present cost of living and there will not be enough trainmen to operate the cars unless a change is made.

Chairman Walsh announced that all the disputed points would be considered by the special section composed of Mr. Taft and himself. He invited the lawyers to join in the Washington hearing where the financial situation will be argued. It was said at the office of the American Electric Railway Association that Past-President Thomas N. McCarter would represent that body at the hearing.

Schenectady Strike Settled

Men Agree to Temporary Advance—City Will Waive Its Franchise Fare Rights

The strike of the employees of the Schenectady (N. Y.) Railway has been settled. It was declared off on June 12 after the men had been out twelve days. They agreed to accept an increase of 6½ cents an hour, and after a four-hour caucus of the Council the Aldermen agreed to waive franchise rights to a 5-cent fare under certain conditions.

Settlement Based on Letter to Mayor

The basis of the settlement was a letter addressed by the Council to James R. Buchanan, federal commissioner of conciliation. This provided that the request of the company to the Council for permission to have the Public Service Commission pass upon its application for increased fares without regard to franchise limitations would be taken up immediately upon the report of the examiners to be employed by and to report to the Council as to the necessity of increased revenue for the company. In conclusion the letter said that if the report showed that the company needed more revenue by increased fares the Council would then grant the railway permission to apply to the Public Service Commission for relief without insisting upon the city's present 5-cent fare rights under the existing franchise.

The men demanded a 9-cent-an-hour increase. They have been getting a maximum of 31½ cents an hour. Final settlement of the wage rate will be determined by the Federal War Labor Board.

Progress on Chicago Drafts

Agreement Reached on Several Additional Points in Proposed New Chicago Ordinance

Representation for the city and the employees on the board of directors of the surface and elevated lines may be made a part of the ordinance for the unification of the lines and the construction of a subway system. This proposition was put up to the companies by a sub-committee of the City Council on June 15. While Mr. Busby said he had no objection to offer, he would refer the matter to the board of directors.

Changes in Financial Plan

Views of security holders on the proposed ordinance were made known to members of the committee by Mr. Busby. His statement applied only to the surface lines, but it is understood that similar contentions will be raised on behalf of the owners of the elevated properties.

The modifications suggested by Mr. Busby applied only to the financial plan, and it is understood that all parties are practically agreed on the other provisions of the ordinance. In brief, Mr. Busby suggested that the interest rate start with 6.35 instead of 6.22 per cent, and that an additional rate of 1¼ per cent be allowed on "new money." Provisions for refunding of existing securities were also discussed, and Mr. Busby contended that there should be proper protection for the money which will go into new construction, as these extensions would have no operating value if anything should happen to the rest of the property.

The sub-committee favored Mr. Busby's suggestion to the extent of removing the 5 per cent limit on cost of refunding. The members also allowed an interest rate of 6.35 on original capital only. At the same meeting Walter Fisher, special counsel, gave an opinion to the effect that the traction fund could not be used by the city for general corporate purposes and also that the city had no authority to invest part of this fund in Liberty Bonds.

Ordinance in Main Acceptable

An adjournment was taken to allow the companies time to give a final answer on provisions of the ordinance as already outlined.

At a meeting of the committee on June 19 Mr. Busby, speaking for all the Chicago companies, stated that the ordinance as previously outlined, accounts of which have appeared in the Electric Railway Journal, was acceptable.

Massachusetts Wage Award

Increase in Wages Awarded to Trainmen and Other Employees in Worcester, Springfield and Other Cities

One of the largest electric railway wage increases ever awarded in New England was announced on June 15 by Henry B. Endicott, executive manager of the Massachusetts committee on public safety, as arbitrator between the Amalgamated Association and the Springfield Street Railway, Worcester Consolidated Street Railway, Interstate Consolidated Street Railway, Attleboro Branch Railroad and the Milford, Attleboro & Woonsocket Street Railway. Mr. Endicott's award follows extended negotiations and conferences between the parties, and extends various agreements for one year from June 1, 1918, besides fixing the rate of pay and other matters bearing upon working conditions. It is estimated that the award will cost the Springfield company alone $400,000 a year in extra operating expenses. Further fare increases appear likely.

On the Springfield system, the daily wage arrangement is continued and the award and previous rates are as follows:

	New Rates	Old Rates
First half year, rate per day..	$3.33	$2.555
Second half year, rate per day.	3.48	2.705
Second-year men, rate per day.	3.60	2.855
Third-year men, rate per day.	3.69	2.955
Fourth-year men and thereafter, per day.....	3.87	3.105

The employees of the Worcester company demanded that their wage scale be fixed for conductors, messengers and motormen at the rate of 45 cents an hour for the fourth and subsequent years of employment instead of at the previous rate of 34.5 cents. In the conferences the company agreed that the maximum rate should be not less than 40 cents an hour. Mr. Endicott found that, taking into consideration the constant increase in the cost of living and the pay of men now in similar industries in Massachusetts, 43 cents an hour was a fair rate, and so decreed. The new schedule for Worcester, which is also made to apply to the other companies except Springfield, is: Fourth year and thereafter, 43 cents; third year, 41 cents; second year, 40 cents; second six months, 38.5 cents; first six months, 37 cents per hour.

Mr. Endicott was asked to decide whether all employees other than messengers, conductors and motormen should receive an increase of 35 per cent in their wages. It appeared from the evidence that the wages of the miscellaneous employees had been based upon no uniform system. Wages of one class of employees in Springfield differed from the wages of the same class in Worcester. Inter-departmental wages also differed in the same city. Several classes of employees received substantial increases in pay since May 1 and others were working for the same scale which had been in effect for some time. The award states:

"If miscellaneous employees were to receive a uniform raise in wages, equal to that received by the blue-uniformed men they would be entitled to an addition of 24.5 per cent over their present rate. I appreciate that uniformity of wages both within each company and throughout all the companies as a group would be advisable if the companies were now just starting in business. I am inclined to believe, however, that apparent inequalities are often due to local conditions, or were originally caused by varying conditions of employment. An attempt to systematize them by an examination of the wage sheet alone without an accompanying intimate knowledge of the histories of the companies would probably lead to injustice. I therefore decide all employees whose wages * * * have not been increased since April 30, 1918, shall receive an advance in pay to the amount of 24.5 per cent of the previous wage, and I leave the minor wage inequalities for gradual adjustment by the men and the companies."

The union urged an eight-hour day instead of a nine-hour day for shop and other employees. It was Mr. Endicott's opinion that a change from a nine-hour day to an eight-hour day at this time was inadvisable. He decided that the working hours should continue as they were prior to June 1, 1918.

The union raised the question whether, if a shorter work day was granted to men in any department such shorter work day should apply to all men doing the same kind of work in such department. It was contended that the hours in some departments were not uniform. In his finding Mr. Endicott refused to order uniformity in hours as requested, and stated that while uniformity was desirable and to be encouraged when practicable, this was not the moment to attempt a readjustment of working hours. The men urged that Sunday and holiday runs be arranged so that eight hours should be the maximum for a day's work, performed within ten consecutive hours, and that cars operating between midnight and 6 a. m. be paid for at the rate of a full day's pay. The arbitrator found it unwise at the present time to make such readjustments of service.

San Francisco Loop Improved

With the completion of four tracks for the full length of Market Street in San Francisco, and the inauguration of through service on municipal cars from Twin Peaks Tunnel to the ferry, total traffic around the ferry loops has been increased about thirty-two cars per hour during the rush period. During the heaviest traffic in the exposition year 275 cars an hour passed around the loop by both systems. Experience since the completion of the improvements recently made indicate that the capacity of the loops will now be more than 300 cars an hour. Under the existing agreement as to routing of cars on inner and outer loops, however, the maximum loop capacity practicable is about 295 cars an hour.

About forty municipal cars have been added to the regular schedule in order to supply the new service on the outer Market Street tracks. A factor that has always prevented any great improvement in running time at the loops has been the heavy vehicular traffic constantly crossing the loop entrance and exit. Grade separation to eliminate this trouble has been frequently suggested, but funds for such changes are not now available. As the present need for increased capacity was brought about by the additional number of municipal cars to use the loop, the reconstruction costs have been borne exclusively by the Municipal Railway system.

Shipping Board Acts Promptly

The United States Shipping Board Emergency Fleet Corporation, A. Merritt Taylor, director of passenger transportation and housing, finding it impracticable to secure from the Telford Road Company and from certain of the boroughs between Darby and Chester, Pa., such franchises for the Southern Pennsylvania Traction Company as that company would be justified in accepting, it proceeded to lay a second track for the account of the government, the same to be operated in conjunction with the company's existing single track, thus making a double-track railway.

In requisitioning so much of the roadbed of the Chester & Darby Telford Company as it required for right-of-way, the Fleet Corporation posted requisition notices along the turnpike.

Ninety thousand workers are engaged in the shipyards and munition plants in the district southwest of Philadelphia, including Chester. Many thousands must be added in the near future in order that the plants may be operated at full capacity and in certain instances materially enlarged.

The double-tracking of the railway on the Chester & Darby Telford road, which is known as the Chester Pike, will give track capacity for the conveyance of 19,000 passengers an hour in one direction. The capacity of the single track which has been in use is limited by a minimum headway or schedule time of fifteen minutes between cars. With two-track operation it will be possible to operate cars on a forty-second headway in each direction.

Provision has also been made by the Emergency Fleet Corporation for enlarging the power supply of the Southern Pennsylvania Traction Company. In addition arrangements have been made for the purchase of twenty-two additional cars. The contract for the construction of the new line has been awarded to McArthur Brothers, New York, who expect to complete the work in about two months.

News Notes

Air Brake Man Honored.—The degree of Doctor of Engineering has just been conferred upon Walter V. Turner, manager of engineering for the Westinghouse Air Brake Company, by the University of Pittsburgh, in recognition of his valuable services to the engineering profession and to humanity.

Wage Increase on Suburban Line.—The Philadelphia Railways, operating 13 miles of line between Philadelphia and Chester, has increased the wages of conductors and motormen, from 30 cents an hour to 35 cents for first-year men, 36 cents for second-year men and 37 cents an hour for third-year men.

Strike on Zanesville City Line.—Because the company offered them an advance of 3 cents an hour, when they had demanded from 5 cents to 7 cents, the motormen and conductors on the city line of the Ohio Electric Railway at Zanesville walked out and completely tied up the service on June 4. The interurban lines were not affected.

Rapid Transit Work Resumed.—Nearly 6000 of the men engaged as laborers on subway and rapid transit construction work in New York returned to work early in the week commencing June 17 under an agreement reached between the Board of Estimate, the Public Service Comission, and contractors and the labor unions, whereby the men are to be paid the increased wage demanded.

Would Arbitrate the Woman Question.—The Toronto (Ont.) Railway is said to have expressed its willingness to refer the question of the employment of women as conductors to a conciliation board. This plan is said to meet with the approval of the men, who at a meeting on May 11 adopted a resolution opposing the use of women at this time. The opposition of the men was referred to in the issue of the ELECTRIC RAILWAY JOURNAL of May 8, page 983.

Trustees to Act On Wage Increase.—M. C. Brush, president of the Boston (Mass.) Elevated Railway, on June 14 sent a letter to the executive board of the union of the employees of the company informing that organization that he will take no action on their request for an increase in wages as it is a matter for the consideration of the new board of trustees. These will be appointed by the Governor and will take charge of the road about July 1.

Wage Demands in Vancouver.—The British Columbia Electric Railway, Vancouver, B. C., already confronted with a demand for increased wages from the conductors and motormen representing an additional expenditure of $520,000, has recently had presented to it a proposed agreement from the electrical workers in the company's employ, which, if granted, will mean another additional expenditure of $120,000. The proposed agreement is a very extensive one, and is designed to establish a flat rate of $6 a day for skilled men.

Pennsylvania Commission's Docket Crowded.—The calendar of the Public Service Commission of Pennsylvania for the week ended June 15 contained a long list of minor cases, including a score or more jitney complaints from western counties and small contract matters between public utilities. The commission will not take any vacation, although the members individually and at different times will be absent for a few weeks from their duties. At Wilkes-Barre on June 13 the commission planned to hear the city of Wilkes-Barre and nine surrounding boroughs present their claims that the rates of the Wilkes-Barre Railway are unreasonable. Inadequate service is charged by the opponents of the increase.

Dayton Men Demand an Increase of Wages.—Although the managers of the electric railways at Dayton, Ohio, expressed their willingness to submit to the National War Labor Board demands made by their employees the men early in the week commencing June 17, assumed a threatening attitude and insisted that the companies grant their request in full. This includes an increase from a minimum of 28 cents and a maximum of 45 cents an hour to a minimum of 45 cents and a maximum of 50 cents an hour. On June 19 the employees of the Peoples' Railway, the City Railway and the Dayton Street Railway went on strike. The companies have asked the City Commission to take over roads and operate them.

Buffalo Rounding Up the Crooks.—Three conductors employed by the International Railway, Buffalo, N. Y., have been convicted of stealing fares recently and the case of another conductor now under arrest is still pending. One of the trio was fined $100; a second was fined $50 and a third was fined $25. It is charged that the men collected the fares from passengers without allowing the passengers to deposit the fares in the fare box. The case of a fourth conductor is being investigated by company officials cooperating with the police. He is charged with making and selling a device which could be inserted in the fare box in such a manner that the coins would not register.

Wage Advance in Davenport.—The Tri-City Railway, Davenport, Iowa, has voluntarily increased the wages of its employees for the fourth time within the past year. Under the 1917-1918 contract, which was effective until June 1, 1918, the wage scale for trainmen varied from 27 cents to 32 cents an hour. On Nov. 1 an increase of 1 cent an hour was voluntarily granted, and on Dec. 1 a 7 per cent war bonus was added to this. On May 1 last the 7 per cent war bonus was increased to a 10 per cent, and on June 6 the war bonuses were discontinued effective June 1 and a straight 4 cents an hour increase was granted, making the present wage scale from 32 cents to 37 cents an hour. Shop men will also receive an increase in wages at this time.

Policy With Regard to Returning Employees.—The management of the Honolulu Rapid Transit & Land Company, Honolulu, T. H., has notified the employees of the company to the effect that "employees entering the federal military service, who shall thereupon notify the company in writing of their intention of returning to their present employment, will be considered as on extended leave; and will be entitled to their seniority upon reporting for duty with an honorable discharge within sixty days from the date of said discharge or termination of federal service, if in a satisfactory physical condition. The retention in service of new employees and their respective rights of seniority and the rights of seniority of present employees, will be subject to the foregoing regulation."

Classification of Military Engineers Suggested.—The fact that many engineers are in the National and the enlisted army at a time when the national organizations are constantly receiving requests for engineers, chemists and other technical men has impelled the Engineering Council, representing the national engineering societies, to address the secretaries of war and navy on the subject. The council urges that "technically trained men of all ages should be enrolled and conserved for technical duties, and special efforts should be made immediately by the War and Navy Departments to find and record such men among drafted and enlisted forces and to assign them to places in which their special qualifications are needed." The Engineering Council offers to assist in locating and classifying such men, if its assistance is desired.

Advance for Interurban Men.—Platform men employed by the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., have been granted a wage increase. For the first six months of service, the men will receive 30 cents an hour; second six months, 32 cents an hour; after the first year, 37 cents an hour in passenger service and 41½ cents an hour in express service. The train crews of the Buffalo, Lockport & Rochester have severed their affiliation with the Order of Railway Trainmen, associated with the Brotherhood of Locomotive Engineers, and have joined the Amalgamated Association of Street & Electric Railway Employees. The Buffalo, Lockport & Rochester men are now allowed to operate their cars between the terminals in Rochester and Lockport. Heretofore the cars were taken at the Rochester city lines by local crews and in Lockport they were taken at the city line by crews of the International Railway, Buffalo, N. Y.

Financial and Corporate

$17,320,000 Advance to B. R. T.

W. F. C. Will Grant Loan if Note Holders Will Exchange 70 Per Cent of Maturing Fives for New Sevens

The War Finance Corporation on June 19 came to the aid of the Brooklyn (N. Y.) Rapid Transit Company with an announcement that it would make a direct loan of not more than $17,320,000 to the company for refinancing purposes. This advance is based upon a proviso requiring holders of the company's maturing notes to consent to exchange not less than 70 per cent of the face value of their holdings for new three-year 7 per cent secured notes. The notes to be retired consist of an issue of $57,735,000 of 5 per cent notes which will come due on July 1.

As collateral for the direct loan the War Finance Corporation will take new three-year notes at par. These will be secured by $57,735,000 of first mortgage 5 per cent bonds of the New York Municipal Railway Corporation, now deposited as security for the present notes, and by $39,000,000 of ten-year 6 per cent bonds of the Brooklyn Rapid Transit Company to be issued under a consolidated and refunding mortgage recently approved by the stockholders. The directors of the War Finance Corporation have decided that the Brooklyn Rapid Transit Company application comes within the scope of the "exceptional cases" clause contained in Section 9 of the act.

The War Finance Corporation received letters from the Comptroller of the City of New York and from the Public Service Commission of the First District of New York expressing a desire that the application of the company be granted in the interest of the city.

B.R.T. Explains Plan

After the announcement by the War Finance Corporation, the railway issued a statement in part as follows:

"A circular will be sent to noteholders during the next few days inviting them to deposit their notes with the Central Union Trust Company of New York under an extension plan under which noteholders will have the privilege of accepting for each $1,000 note either (a) $300 in cash and $700 face value of the new three-year 7 per cent secured notes, or (b) $1,000 face value of the new three-year 7 per cent secured notes.

"The indenture will provide that the company will cause to be pledged thereunder any additional consolidated and refunding mortgage bonds to an amount equal at face value to expenditures made out of the current surplus earnings of the company for capital purposes and for which the company may be or become entitled to draw bonds from the trustee, as well as any first mortgage 5 per cent sinking-fund gold bonds acquired by the company with such current surplus earnings.

"In order to conserve cash and to that extent to avoid the sale of additional securities pending the life of the new notes, the indenture will further provide that while the notes are outstanding the company will pay no dividends upon its capital stock in cash or in any securities or script unless such security or script shall by its terms rank subsequent to the rights of the holders of the notes as against any of the assets of the company.

"The plan has been approved by Kuhn, Loeb & Company, the Central Union Trust Company of New York and Kidder, Peabody & Company, the bankers who placed the maturing issue of notes and who represent a large amount thereof."

$100,000,000 Utility Pool Proposed

James N. Wallace, president Central Union Trust Company; Thomas W. Lamont, of J. P. Morgan & Company; Charles H. Sabin, president Guaranty Trust Company, and Frederick W. Strauss, of J. & W. Seligman & Company, all of New York, have been appointed as a committee by W. P. G. Harding, managing director of the War Finance Corporation, to consider the question of giving aid to public utility companies. The appointment of the committee is the result of a recent conference in New York between directors of the War Finance Corporation and representative bankers, as noted in the ELECTRIC RAILWAY JOURNAL of June 15.

One matter which this committee is said to have under consideration is the organization of a $100,000,000 corporation, the function of which would be to purchase the securities of public utilities and in turn discount its paper with the War Finance Corporation. Bankers throughout the country would be asked to subscribe to the capital stock of the company in proportion to their ability to do so, thus spreading any risk which might be involved and at the same time insuring the active co-operation of leading financial interests in all sections toward securing better treatment for public service properties.

It is reported that conferences in the matter have been held, but that no definite decisions as to the formation of such a corporation have been reached.

The Chicago Clearing House has named E. D. Hulbert, of the Merchants Loan & Trust Company; George M. Reynolds, of the Continental & Commercial National Bank, and F. O. Wetmore, of the First National Bank, as a committee to consider the need of public utility relief from the various financial burdens of the present.

Power Needs Recognized

The War Industries Board has sent to Congress the draft of a proposed bill to appropriate $200,000,000 to increase the power supply in overloaded industrial centers of the East. Cities along the Atlantic seaboard in which munitions and materials for war are being manufactured would be the especial beneficiaries under the measure, which has been committed to the care for the present of Representative Kitchin, chairman of the House ways and means committee, and of Senator Martin of Virginia, chairman of the appropriations committee. The measure is said to have the backing of President Wilson.

It is felt in Washington that much more than $200,000,000 will be needed, inasmuch as in the Pittsburgh district alone, which supplies power for a radius of 100 miles, $40,000,000 or $50,000,000 for additional plant facilities might be needed. The War Industries Board is now making a census of the various power needs of the different localities engaged upon war work.

The proposed measure is emergency legislation. It is expected by the Washington correspondent of this paper, however, that it will be difficult to pass in Congress, although all government interests engaged in obtaining war material admit that such legislation is needed at once.

Lima Tramway Earnings Gain

The report of the Lima (Peru) Light, Power & Tramway Company for the year ended Dec. 31, 1917, shows a gross revenue of $2,142,480, an increase of $156,120 over 1916. The operating expenses amounted to $1,436,295, an increase of $76,740. In commenting on these results the directors refer to the increased tramway traffic, increased employment of electric power and the high premium on Peruvian currency as factors contributing to the improvement in revenues. On the other hand, the increased cost of raw materials and the growing difficulty of securing materials at any price from the United States are factors reflected in the increased expenses.

The gross revenue from the tramways in 1917 amounted to $1,085,890, expenses to $694,995 and net profits to $390,895. The gross revenue increased by $84,130, expenses by $61,520 and net profits by $22,610.

Four quarterly dividends were declared during 1917, amounting to a total of 5 per cent for the year. The net profits were distributed as follows: $374,720 for amortization and depreciation; dividends distributed, $328,460; carried forward to profit and loss, $3,010. The balance of the profit and loss account on Dec. 31, 1916, was $456,195.

Standard G. & E. Gains

Reports for Railway Subsidiaries Show Revenues Nearly Back at the 1913 Mark

The gross earnings of the subsidiaries of the Standard Gas & Electric Company, Chicago, Ill., for 1917 showed an increase of 12.92 per cent over the previous year. These gross earnings, aggregating $19,341,487, were derived from seven different classes of utilities, 4.18 per cent coming from electric railway operation. The accompanying statement gives a summary income report for the utilities giving railway service. The total railway receipts in 1917 were $808,625 as compared to $753,725 in 1916. The receipts almost reached the 1913 mark of $828,168.

The Arkansas Valley Railway, Light & Power Company exceeded expectations for 1917. The year was one of exceptional prosperity for the territory served. The gross earnings increased 13.3 per cent, with an increase of 14.2 per cent in net. In 1916 these increases were 7.6 per cent and 11.7 per cent respectively.

The Ottumwa Railway & Light Company during the year added a considerable amount of new lighting and power business. The Fort Smith Light & Traction Company is retaining its former standing among the subsidiaries. During January and February, 1918, this company earned materially in excess of its proportionate interest charges, and for the twelve months ended Feb. 28, 1918, it showed a surplus. The improvement is due primarily to the establishment of a number of new industries, whose location was partly influenced by the discovery of new gas fields in the vicinity.

The report states that the placing of securities of the respective companies in the communities served has proved to be even more successful in 1917 than was anticipated from the excellent results obtained in 1916. Customer ownership is appealing to the public in an increasing degree. From Jan. 1, 1917, to March 23, 1918, inclusive, local sales numbered 5240, aggregating $4,008,350 par value of securities.

On Dec. 31, 1917, the total depreciation reserves of the subsidiary companies amounted to $3,273,658. The surplus balance of these companies totaled $1,505,125, making an aggregate amount of $4,778,783. This has been invested in extensions and enlargements of the properties.

The total taxes of the subsidiaries during 1917 were $1,436,414, equal to 7.42 per cent of the aggregate gross earnings and 16.85 per cent of the aggregate net earnings. The increase in taxes in 1917 was $273,602, and the increase in six years has been $826,666.

1917 INCOME STATEMENT OF RAILWAY SUBSIDIARIES OF STANDARD GAS & ELECTRIC COMPANY

Company	Gross Earnings	Net Earnings	Interest Charges (Net)	Amortization of Debt Discount and Expense	Dividends 1917 Income Charged to Preferred	Dividends 1917 Income Charged to Common	Earnings Retained in Surplus or Depreciation Reserve	Deficit after Interest Charges
Arkansas Valley Railway, Light & Power Company	$1,428,467.23	$645,222.05	$370,532.75	$2,500.00	$66,578.35	$135,000.00	$70,610.95	.....
Fort Smith Light & Traction Company	508,669.52	154,266 14	181,912.33	.....	.....	.....	.....	$27,646.19
Northern States Power Company	7,154,508.89	3,389,780.50	1,709,837.74	140,000.00	916,011.05	188,931.71	435,000.00	.....
Ottumwa Railway & Light Company	365,406.66	142,989.07	67,982.03	250.00	32,382.00	24,375.00	18,000.04	.....

Financial News Notes

Small Bond Issue Authorized.—The Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., has been authorized by the Indiana Public Service Commission to issue $28,000 of bonds to reimburse the treasury for sums expended for extensions and betterments.

Northern Ohio Proposes New Security Issues.—Application has been filed with the Ohio Public Utilities Commission by the Northern Ohio Traction & Light Company, Akron, for permission to issue $600,000 of first mortgage 5 per cent bonds and $160,000 par value of preferred stock.

Abandonment in Tennessee.—The Holston Valley Railway, operated by the Bristol (Tenn.) Traction Company, between Bristol and Big Creek Park, Tenn., a distance of 10 miles, will discontinue operation. Orders have also been issued by J. A. Caldwell, receiver for the Bristol Traction Company, for the removal of the former company's tracks on several of the streets in Bristol.

Pittsburgh Argument on July 1.—The United States District Court for the Western District of Pennsylvania has fixed July 1 for hearing arguments on the questions at law raised in answer to the bill brought by the protective committee of bondholders of the Pittsburgh Railways and subsidiaries against the Philadelphia Company, Pittsburgh Railways and the United Traction Company, Pittsburgh.

$1,000,000 Mortgage Authorized.—The stockholders of the Syracuse & Suburban Railroad, Syracuse, N. Y., have authorized a mortgage of $1,000,000 to secure an issue of bonds for that amount. Of the money raised through this issue, $550,000 will be used to pay outstanding bonds. Part of the remainder will be used to reimburse the company for capital expenditures and the rest will be held in the treasury.

Authorized to Fund $182,500 of Notes.—Springfield (Ill.) Consolidated Railway, controlled by the Springfield Railway & Light Company, has been authorized by the Illinois Public Utilities Commission to issue two lots of 5 per cent gold bonds, one for $75,500 and the other for $107,000. The total amount of $182,500 is needed to pay notes issued by the company since Dec. 31, 1913, representing improvements of a permanent nature.

Lethbridge Deficit $28,800.—The Lethbridge (Alta.) Municipal Railway in 1917 did slightly better than was anticipated. The deficit for the year amounted to $28,878, whereas the result had been estimated at $30,178. The cost of operation was kept as low as possible, according to the report of the local commissioner, and the improved patronage increased the earnings. The earnings figures for the last calendar year follow: Earnings $52,203; operating expenses, $43,821; fixed charges, $37,260; deficit $28,878.

$350,000 of Arkansas Valley Notes Offered.—H. M. Byllesby & Company, Inc., Chicago, Ill., and Bonbright & Company, Inc., New York, N. Y., are offering for subscription at 97¾ and accrued interest $350,000 of bond secured 7 per cent gold notes of the Arkansas Valley Railway, Light & Power Company dated June 1, 1918, and due Dec. 1, 1920. The total authorized issue is $1,500,000. The proceeds of the sale of the notes will reimburse the company for expenditures incurred for additions and improvements to the property.

$1,581,000 of West End Refunding Bonds—The West End Street Railway, Boston, Mass., has requested the authorization by the Public Service Commission of an issue of $1,581,000 of its bonds to refund an equal amount of bonds due on Aug. 1, 1918. In case the proceeds of the sale of the bonds are more than sufficient for that purpose the West End company will pay to the Boston Elevated Railway such excess to be invested in permanent additions, alterations and improvements upon the property of the West End in accordance with the terms of the lease.

Short Iowa Road Abandoned.—Electric railway communication between Sioux City, Iowa, and Dakota City, Neb., has been severed by the Sioux City, Crystal Lake & Homer Electric Railway and will not be resumed. The line between Sioux City and Dakota City was built about twelve years ago, but has never been a paying proposition. The property was recently ordered to be junked. Already a portion of track in Dakota City has been torn

up and the rails between Crystal Lake and Dakota City have been sold. Cars will be run during the summer season between South Sioux City and Crystal Lake.

Purposes of New Puget Sound Issue.—The issue of $12,250,000 of 7 per cent three-year mortgage gold notes of the Puget Sound Traction, Light & Power Company, Seattle, Wash., referred to in the ELECTRIC RAILWAY JOURNAL of June 15, will be used to refund $10,057,000 of 6 per cent mortgage bonds of the company maturing on Feb. 1, 1919, and to enable the company to take care of construction work now under way, including the White River development of 20,000 hp., the 10,000-kw. steam unit at Georgetown, and the steam plant on Western Avenue. These projects will cost in the neighborhood of $1,250,000.

Crosstown Road to Be Sold Under Foreclosure.—The property and franchises of the Central Crosstown Railroad are to be sold at auction by Referee Lyttleton Fox, and the New York Railways Company, which is now operating the road, will be the purchaser if the Public Service Commission clothes it with the necessary authority. Foreclosure proceedings against the Central Crosstown Railroad were instituted because of a default of principal and interest under the company's first consolidated mortgage. A public hearing on the application of the New York Railways for permission to make the purchase was set by the Public Service Commission for June 20.

$2,151,000 of Refunding Bonds Authorized.—The Public Service Commission for the Second District of New York has authorized the Albany (N. Y.) Southern Railroad to issue $2,151,000 of first refunding mortgage thirty-year 6 per cent bonds. Of this amount $1,451,000 is to be used by the company in exchange for a like amount of first mortgage thirty-year 5 per cent bonds now outstanding. The company is also authorized to pledge $700,000 in 6 per cent bonds as security for its three-year notes amounting to $550,000, to be sold at not less than 96, and the proceeds are to be used to reimburse the treasury, to discharge floating liabilities outstanding on June 30, 1917, and to pay for proposed new construction amounting to $190,683.

P. R. T. Wants War Taxes Shifted.—E. A. Ballard, counsel Philadelphia (Pa.) Rapid Transit Company, recently asked the ways and means committee of the House of Representatives to draft the new war-revenue bill so that the underlying companies must pay the war taxes themselves. The leases under which the Philadelphia Rapid Transit Company now operated requires this corporation to pay all taxes on the earnings of the underlying companies, but Mr. Ballard desires the law to state specifically that the contracts apply only to ordinary taxes and not to special war taxes. The leased companies are planning to oppose this change, on the ground of the inviolability of the contract.

Drawing New Plan to Care for Interest Payments.—T. Porter, secretary of the committee of bondholders of the Barcelona Traction, Light & Power Company, Ltd., Barcelona, Spain, on June 18 addressed a statement to the holders of the bonds of the company to the effect that owing to the delay and complications resulting from the continuance of the European war, it will be impossible for the company to resume full payment in cash of the interest on its bonds on Dec. 1, 1918, as was contemplated when the bondholders met in June, 1915. He says the committee, in consultation with the directors, are formulating a plan, the basis of which will be the payment in cash of a portion of the interest commencing with the coupon due on Dec. 1, 1918, with compensating arrangements for deferring payment of the full interest. In due course the plan will be submitted to the bondholders for their approval. In the meantime the committee requests holders of the interim scrip issued during the last three years in satisfaction of the interest coupons, to defer lodging the same for exchange into definitive notes.

Indianapolis Security Holders Organize.—J. F. Wild, president of the J. F. Wild State Bank, Indianapolis, Ind., has been elected as the chairman of a committee of fifteen security holders of the Indianapolis Street Railway to represent the newly-organized Association of Indiana Holders of Indianapolis Street Railway Securities. The committee is composed of the following: H. H. Hornbrook, Indianapolis; W. T. Durbin, Anderson; E. L. Mckee, Indianapolis; Walter J. Ball, Lafayette; R. K. Willmann, Hartford City; John W. Smith, Muncie; Frank Donnar, Greencastle; Henry C. Bennett, Robert Elliott, George C. Hitt, Otto N. Frenzel, Samuel Reid, J. F. Wild and Michael Ready, Indianapolis, and W. L. Hough, Greenfield. J. M. Pearson, of J. F. Wild & Company, has been appointed to act as secretary of the organization. The plan to organize was referred to in the issue of June 8.

New Orleans Refunding Plan Arranged.—The New Orleans Railway & Light Company has authorized an issue of $4,000,000 of one-year 7 per cent notes, dated June 1, 1918, due June 1, 1919, and callable at 100 and interest on thirty days' notice, for the purpose of refunding its two-year notes of an equal amount which matured on June 1, 1918. The company requests that all holders of the matured two-year notes deposit same for exchange for the new notes dollar for dollar. Details of the extension, as well as copies of the correspondence between the Mayor of New Orleans and the company, in response to the latter's request for increased rates, have been mailed to all noteholders of record. The company was unable to meet the notes at maturity on account of the refusal of the War Finance Corporation to advance the necessary funds. The letter of President D. D. Curran of the company on this phase of the matter was published in part in the issue for June 8.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$74,840	*$44,032	$30,808	$19,557	$11,251
1m., Apr., '17	70,632	*41,137	29,495	18,841	10,654
12m., Apr., '18	897,032	*530,058	366,974	232,075	134,899
12m., Apr., '17	860,144	*486,017	374,127	219,215	154,912

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Apr., '18	$145,620	*$107,066	$38,554	$30,996	$7,558
1m., Apr., '17	111,840	*77,929	33,911	29,649	4,262
12m., Apr., '18	1,503,319	*1,279,649	223,670	364,362	†140,692
12m., Apr., '17	1,260,774	*875,961	384,813	358,215	26,598

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

1m., Apr., '18	$346,988	*$242,089	$104,899	$56,644	$48,255
1m., Apr., '17	304,819	*222,485	82,334	44,938	37,396
12m., Apr., '18	4,157,639	*3,088,042	1,069,597	598,598	470,999
12m., Apr., '17	3,677,280	*2,339,418	1,337,862	522,904	814,958

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m., Apr., '18	$1,721,352	*$1,122,208	$599,144	$494,273	$104,871
1m., Apr., '17	1,502,961	*895,423	607,538	430,014	177,524
12m., Apr., '18	20,311,495	*13,326,305	6,985,190	5,504,730	1,480,460
12m., Apr., '17	17,735,092	*10,142,214	7,592,878	5,087,199	2,505,679

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$246,126	*$169,013	$77,113	$71,158	$5,955
1m., Apr., '17	233,439	*158,628	74,811	66,499	8,312
12m., Apr., '18	3,090,145	*2,150,267	939,878	841,377	98,501
12m., Apr., '17	2,959,916	*1,893,698	1,066,218	810,671	255,547

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., Apr., '18	$321,032	*$245,482	$75,550	$67,686	$7,864
1m., Apr., '17	298,279	*185,584	112,695	64,945	47,750
12m., Apr., '18	3,806,380	*2,728,789	1,077,086	795,086	282,505
12m., Apr., '17	3,247,423	*1,999,445	1,247,978	962,727	485,251

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.

1m., Apr., '18	$73,081	*$57,264	$15,817	$19,412	†$3,595
1m., Apr., '17	68,053	*50,275	17,778	15,702	2,076
12m., Apr., '18	873,818	*728,709	145,109	194,767	†49,658
12m., Apr., '17	836,375	*596,756	239,619	185,585	54,034

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m., Apr., '18	$616,280	*††$366,427	$249,853	$178,385	$71,468
1m., Apr., '17	473,358	*260,594	212,764	183,824	28,940
12m., Apr., '18	6,530,330	*††3,961,029	2,569,301	2,134,071	435,230
12m., Apr., '17	5,617,994	*3,048,517	2,569,477	2,182,930	386,547

* Includes taxes. † Deficit. †† For the month $18,518, and for twelve months $252,848 included for depreciation.

Traffic and Transportation

Trenton Fare Case Continued

Final Hearing in Appeal for Six-Cent Fare Expected to Be Held on June 25

The hearing on the application of the Trenton & Mercer County Traction Corporation, Trenton, N. J., for a straight 6-cent fare was continued before the Board of Public Utility Commissioners on June 13 and will probably be completed on June 25. An appraisal of the company's property was presented as made by the J. G. White Engineering Company. John W. Burke, of the White Company, occupied the stand the greater part of the day. He placed the value of the physical property at $4,875,614. George L. Record, representing the city of Trenton, objected to the acceptance by the utility board of this valuation, stating that a previous one had been made in 1915.

Valuation Figures Admitted

The company maintained that the utility board had ruled that an appraisal of property would be required in connection with any application for increased rates, and that previous valuations were only general approximations. Chairman Slocum, of the utility board, permitted the appraisal to be admitted as evidence. The valuation did not include any allowance for intangibles. In the Passaic Gas case, it was stated, the utility board allowed 30 per cent for intangible items, and if a similar allowance was made in the present case the total valuation of the Trenton system would amount to more than $8,300,000.

Mr. Burke said he based his valuation on what he termed "normal fair prices." He said the valuation at prevailing war prices would be $6,148,700, which is about $1,250,000 more than his estimate of the fair value of the physical property. Mr. Burke estimated the annual depreciation fund for renewals, replacements and reserves at from $150,000 to $175,000.

Fares Elsewhere No Criterion

President Rankin Johnson, recalled to the stand, gave figures he was asked to furnish at the last hearing as to cost of materials and equipment during the years 1914, 1915, 1916 and 1917. Counselor Edmund M. Hunt endeavored to have the witness testify as to a comparison of fares in Trenton and in other cities of the country, but President Slocum ruled that it was immaterial in this case what the fares were in other cities. Mr. Johnson read correspondence between the company and the trolleymen's union in which an increase to 40 cents an hour flat rate was demanded and in which the company offered a graduated scale reaching a 40-cent rate after five years of service. Mr. Johnson testified that the company had figured, when it made its application for an increased fare, on spending $20,000 a year for increased pay for its employees. The men's demands would entail an added expenditure of from $60,000 to $80,000. Mr. Record asked that this testimony be ruled out as the pay increase was as yet not an accomplished fact, but President Slocum ruled that it should remain in the record.

The hearing was adjourned until June 25.

Columbus Fare Hearing Begun

At a meeting of the Columbus City Council on June 7 Samuel G. McMeen, president, and Harold W. Clapp, general superintendent of the Columbus Railway, Power & Light Company, Columbus, Ohio, presented arguments for the increase of the rate of fare from eight tickets for a quarter to 5 cents straight, with universal transfers. Six business men joined in the plea.

President McMeen declared that the company wanted to pay its employees more money for their work, but could not do so at the present rate of fare. In connection with this, though he did not mention it, there are rumors that the men are organizing for the purpose of demanding an increase in their wages. Mr. McMeen further stated that if a temporary bridge is erected across the Scioto River at Broad Street the company will lay tracks, so that cars may be operated on the West Broad Street line across it.

J. Clare Miller, director of the Columbus Chamber of Commerce, declared that efficient service was needed in order to carry out the work at the plants which are making war materials. In view of the increased cost of all labor and materials, he favored an increase in the rate of fare, so the company will be able to furnish such a service.

George M. Schwartz, president of the Manufacturers' and Jobbers' Association, reported that at a recent meeting of that organization, most of the members spoke in favor of granting an increase in the fare. Several others spoke along the same line and one or two stated that some extensions must be built in order to keep pace with the increase in population and the growth of the town.

Councilman Alcot declared he would oppose any increase in the rate of fare because of the following clause which he said appears in the franchise:

"The municipality shall not, during the terms of such grant or renewal, release the grantee from any obligation or liability imposed by the terms of such grant or renewal of a grant."

All Baltimore Skip Stops

This Method of Operation Applied to Entire Maryland City in About a Month

The staggered skip-stop method of car operation has been applied to all the lines of the United Railways & Electric Company, Baltimore, Md.

The process of application was a gradual one, beginning on April 7 with two lines. In quick succession the method was adopted on other lines so that in about a month the entire system was being operated under this plan.

The adoption of the staggered skip stop on the lines in Baltimore was accompanied with extensive publicity to inform the patrons of the method of operation; its purpose and advantages, and the points of each individual line which would be affected. This publicity included the use of advertising space in the newspapers, car window posters, large car cards, the company's publication for its patrons, *Trolley News*, and other agencies.

The company presented in a special edition of *Trolley News* a letter from P. B. Noyes, director of conservation of the United States Fuel Administration, to F. A. Meyer, fuel administrator of Maryland, urging the adoption of the staggered stop in Baltimore as the means of coal conservation. A letter from Mr. Meyer transmitting Mr. Noyes' letter to the Maryland Public Service Commission was also presented to the public. While the United Railways had for some time been considering the staggered skip stop and had actually tried the skip-stop method of operation on a few lines last year, the application of the staggered stop at this time was due particularly to the urgent recommendation of the government.

Territory Surveyed Carefully

Extreme care was exercised in surveying every one of the lines of the United Railways for the purpose of fixing the stops in each direction on all of these, and these surveys were checked and rechecked by experts who personally went over the ground in order to see that the stops should be absolutely fair and equitable to the public. That this detail work was very thoroughly done is testified to by the fact that there have been comparatively few complaints.

As the staggered skip stop was put into operation on each line the stopping places were clearly indicated by signs on the poles nearest the stopping points which designated these points. These signs were labelled "North Stop," "South Stop," "East Stop," or "West Stop." The lettering was black on a white background.

A special edition of *Trolley News* was issued for each line as the staggered skip stop was applied to it, and these special editions were placed in the racks of the cars of the line affected. They described the method of operation and gave a list of the stopping places of the cars in both directions.

Rate Limit Removed in Jersey

Highest Court Supports State Regulation of Franchise Rates—Public Service Fare Case Is Now Closed

The last legal barrier to the determination of fair rates in New Jersey has been removed by a ruling of the court of final jurisdiction that franchise rates are alterable. This decision is of far-reaching importance in connection with pending applications for higher fares, including that of the Public Service Railway, which operates through most of the State. The hearings in this particular case have been completed, and it is expected that a decision will soon be announced by the Board of Public Utility Commissioners.

State Rate-Making is Supreme

The ruling in regard to the paramountcy of the State rate-making power was handed down on June 17 by a seven-to-two vote of the New Jersey Court of Errors and Appeals. The case was that of the Atlantic Coast Electric Railway vs. Board of Public Utility Commissioners. The decision affirms the opinion of the Supreme court of the State as expressed in the recent Collingswood Sewerage Company and Northampton, Easton & Washington Traction Company cases, noted in the ELECTRIC RAILWAY JOURNAL of March 30, page 623.

The syllabus of the decision now rendered by the Court of Errors and Appeals makes the following statements:

"The Senate and General Assembly, in whom by our Constitution the legislative power is vested, must necessarily, as the representative of all the people of the State, be held to retain all the sovereign powers, except as far as they have by unmistakable language intrusted them to others. The traction acts of 1893 and 1896 did not expressly authorize municipalities to contract with street railway companies. The power is implied from the power to grant or refuse consent to a location of tracks, and to impose lawful restrictions; the implication of power ought not to be extended beyond the necessities of the case.

"Full effect can be given to the language of the traction acts of 1893 and 1896 by holding that the force and effect of a contract under Section 32 of the act of 1893 is the force and effect of a contract by which the municipality and the railway company, the only parties thereto, are bound, but that no restriction is thereby implied on the sovereign powers of the State to fix such just and reasonable rates as subsequent conditions may make desirable.

"The power of a municipality to impose lawful restrictions upon granting consent to the location of tracks of a street railway is subject to the condition that they be reasonable. The lawful restrictions that may be imposed upon granting consent to the location of tracks of a street railway must be lawful not only at the time, but from time to time, that is, at all times."

Constitutional Question Not Involved

In its opinion the court says:

"Our Constitution does not, like the Constitutions of some other states, confer upon municipalities the right to grant street franchises. We have been careful to keep the sovereignty of the State unimpaired and have not parcelled out the sovereign powers among minor political subdivisions.

"Municipalities with us act solely by virtue of legislative authority and as legislative agents. The Legislature may intrust to municipal corporations certain powers and may even authorize them to make irrepealable contracts, but the courts ought to be, as they have been, astute to see that such powers are not unnecessarily extended by implication."

Upon the legal reasons above expressed, the Court of Errors and Appeals has now reversed the Supreme Court decision which held that because Bradley Beach had a contract with the Atlantic Coast Electric Railway for a straight 5-cent fare, without a transfer within Bradley Beach, the commission was without power to grant a transfer and thereby bring about a change in the rate.

Final Arguments in Public Service Case

The Board of Public Utility Commissioners on June 12 heard the final arguments on the application of the Public Service Railway for permission to raise its fare from 5 cents to 7 cents and also charge 2 cents for transfers, with an additional cent for a transfer upon a transfer. Notes on the testimony presented in this case since April have been published from time to time in the ELECTRIC RAILWAY JOURNAL.

The counsel for the municipalities, in closing, argued that it would be preposterous for the commission to set aside the 5-cent fare clauses in franchises and at the same time permit the franchises otherwise to stay in force. The municipalities, it was asserted, should have the right to dictate entirely new franchises. The city counsel, however, opposed the whole idea of altering the existing franchises, on the ground that restrictive fare clauses should not even be set aside as a war measure.

Thomas N. McCarter, president, made the final arguments for the railway. In his view, the fundamental question in New Jersey as in all parts of the country is whether or not the electric railway industry can continue to perform its functions, so important for war purposes. Judging by what has developed since the proceeding was started before the commission and what is going on in the steam railroad field, he felt that the relief to be granted ought to be greater than that asked for in the petition. There ought to be 7-cent fare with a suspension of the right to transfer. With the danger of increased wages coming from an order of the War Labor Board, with the danger of increased taxes and with the certainty of higher coal and other costs, he did not believe that any less increase would give the desired relief.

Trans-Bay Fares Increased

Key Route Permitted by California Commission to Equalize or Balance Rate Situation

The Railroad Commission of California has granted the application of the San Francisco-Oakland Terminal Railways for an increase of its commutation and suburban rates to conform with rates carried in the tariffs filed with the commission on June 5 by the Southern Pacific Company covering trans-bay service. Nothing in the order is to be construed as authorizing an increase in fares on the traction division of the San Francisco-Oakland Terminal Railways.

The Railroad Commission has, on the other hand, dismissed the application of the Southern Pacific Company for an increase of trans-bay and suburban rates. The company asked for this action, or an indefinite continuation of its application.

The San Francisco-Oakland Terminal Railways, the Key Route company, asked the commission for authority to increase its passenger fares between San Francisco and points reached by its lines in Alameda and Contra Costa Counties. Shortly after the case came before the commission, the Southern Pacific Company also asked the commission for authority to increase its trans-bay passenger fares with the exception of the creek route, and later included this. Still later the Key Route applied for a readjustment of its street car fares in Alameda and Contra Costa Counties. All these proceedings were consolidated and hearings held. It was at this time that the railroads were taken over by the government under Director General McAdoo, and the trans-bay suburban service of the Southern Pacific came under federal control.

Director General McAdoo initiated new passenger and freight rates on all federally controlled railroads, the passenger rates effective on June 10. This new rate increased commutation fares 10 per cent on the Southern Pacific lines.

The Railroad Commission, considering this action of the federal authorities, that trans-bay rates have been on a parity continuously since the inauguration of the service of the two systems, and that the entire suburban transportation structure rests on this basis, decided that this parity should be continued pending a complete study of the situation. The commission has before it all of the data necessary for

definite conclusions, but it has not yet been possible to come to a final decision. It states its belief that a 10 per cent raise is entirely warranted.

The rate increases (commutation and one-way fares) for trans-bay service are to apply only while the San Francisco-Oakland Terminal Railway's rate application (No. 2985) is under consideration by the Railroad Commission and until the effective date of the final decision as to the proper rates to be granted upon such application. The trans-bay rates now are: Monthly trans-bay commutation rates, $3.30; increased from $3. One-way trans-bay rates, 11 cents; increased from 10 cents.

Poughkeepsie Fare Increase Allowed

The Public Service Commission for the Second District of New York has granted the petition of the Poughkeepsie City & Wappingers Falls Electric Railway for a 6-cent fare upon the understanding that no dividends are to be paid upon the capital stock until the railroad and equipment of the company are brought to a state of efficiency. Chairman Hill's memorandum specifically details improvements which should be made by the company.

The commission held that the company was not giving proper service and that this fact would warrant it in denying an increased fare on the principle that service should precede payment and unless the increased revenues will be used to better the service, the commission says it would be extremely reluctant to grant an increase.

There were no municipal fare restrictions in franchises given the company. An abutting property owner, in a statutory written consent, required a 5-cent fare limit between Vassar College and the New York Central Railroad station and this limitation was invoked at the hearing. The commission holds that fares cannot be fixed by private contract as regulation of rates is a governmental function.

No questions were raised on the trial as to the accuracy of the company's proof of its financial condition and the commission says there seems to be no escape from the conclusion that the company has made its case for an increase of rates.

The extent to which so-called intangible assets of a public service corporation, as a component part of the capitalization upon which a return should be computed, is another matter that is discussed.

Company Upheld in Forfeiture Case

Judge Chatfield in the United States District Court for the Eastern District has granted a permanent injunction restraining the city of New York from forfeiting the contract of the Manhattan & Queens Traction Corporation for failing to complete the extension from South Jamaica to the city line.

Six-Cent Fare for Buffalo

City Council Votes to Recommend This Fare to Public Service Commission as War Measure

Recognizing the necessity for allowing the International Railway, Buffalo, N. Y., to charge a higher rate of fare than 5 cents so as to prevent a walkout of the company's employees, who demanded a substantial wage increase, and also to keep the company from threatened receivership, the City Council on June 14 voted to recommend to the Public Service Commission that the railway be allowed to charge a 6-cent fare within the city of Buffalo.

Company Will Appeal to Commission

An immediate application will be made by the company to the commission for permission to charge a 6-cent fare in the city of Buffalo. As the result of the action taken by the City Council, there will be no objection on the part of the municipal authorities. It is expected that the 6-cent charge will be approved by the commission so it can be put into effect by July 15.

The approval by the City Council of the company's application for a 6-cent fare prevented a strike of the company's motormen and conductors called for June 15. As soon as the Council agreed to recommend the increased fare to the commission, officers of the company conferred with representatives of the platform men. As a result a new wage scale was agreed upon to become effective as soon as the 6-cent fare is approved by the commission. The new scale follows: First-year men, 35 cents an hour, an increase of 8 cents an hour over the old scale; second-year men, 37 cents an hour, an increase of 9 cents; third-year men, 39 cents, an increase of 10 cents; fourth-year men, 41 cents, an increase of 10 cents, and fifth-year men, 41 cents, an increase of 7 cents.

Financial Retrenchment to Follow

Under the provisions of the agreement between the City Council and the International Railway the company agrees to suspend all dividends other than those necessary to provide funds to pay the interest on the bonds of the International Traction Company. This means that dividends will continue to be paid on common stock of the International Railway, but that no dividends will be paid on the common stock of the International Traction Company.

Petitions are being circulated in the city for a referendum vote on the action taken by the City Council. The Corporation Counsel of the city says that a referendum can properly be held, but Henry W. Killeen, of counsel for the railway, says that a referendum is illegal because the action of the City Council does not give the company a higher fare, but merely recommends that the Public Service Commission give the company permission to charge a higher rate of fare. This procedure is necessary because of the company's franchise, known as the Milburn agreement, which fixes 5 cents as a maximum fare which can be charged within the city limits.

The extra money collected by the company by reason of the 6-cent fare must be placed in a separate fund which shall be devoted exclusively to the payment of the increased wages of the company's employees; to provide additional maintenance and renewals requested or directed by the Public Service Commission, and to provide other betterment of service which may be required by the City Council.

Each month the company is to make a written report to the Council of its receipts and disbursements in the city for the calendar month in form as may be required by the Council. All the books, accounts, reports, agreements and documents of the company are to be open and accessible to the Council at all times. All contracts, franchises and grants made by the city since 1890 are to remain in force notwithstanding this agreement.

Company Held by $300,000 Bond

The agreement will continue for the duration of the war and for six months thereafter. The company has agreed to give the city permission at that time to take steps in an action which may, if successful, abrogate the company's 999-year franchise. The company will give a bond for $300,000.

The action of the City Council followed an investigation into the company's financial condition. The inquiry covered a period of almost six weeks. The report of the investigators showed that the company was in a very poor financial condition and was unable to pay its employees a higher wage without an increase in the rate of fare.

Advance Asked in Class Rates

Petitions are being filed by the interurban railways of Indiana with the Public Service Commission, asking for an increase of 25 per cent on all class and commodity rates. The petitions of the Public Utilities Company, Evansville; Marion & Bluffton Traction Company, the Evansville Railway and the Ohio Electric Railway were filed on June 17, and the petitions of the other interurban railways of the State were to be filed by June 19.

In nearly all of the petitions for an increase in freight rates it is shown that the electric railways are practically doing an express business at steam road rates, and unless they receive the same rate of increase that was granted to the steam road carriers, which will be effective on June 25, the electric railways will be swamped with freight business which they would not have the facilities to handle. A decision is asked by June 25.

Compromise Fare Increase Approved

Massachusetts Commission Signifies Its Willingness to Approve Modified Fare System, with Reduced Rates at Off-Peak Hours

In a forty-eight page finding dated June 11 the Public Service Commission of Massachusetts announced its willingness to approve a compromise fare increase schedule on the Bay State Street Railway, following extended hearings during which representatives of the company and the principal municipalities served agreed upon many of the rates under consideration and as modified in conference. A new schedule will be filed by the company embodying the various changes.

The unit of cash fare is at present 6 cents. In general, the city districts have an inner zone in which free transfers are given and an outer zone in which the unit fare carries only to and from the city center or intermediate points, without transfer privileges. The maximum haul per single fare varies considerably. The interurban lines are divided into zones of varying lengths which frequently overlap to avoid charging a double fare for short local rides. North of Boston the longest zone on such lines is 7.93 miles and the shortest, 1.37 miles, the corresponding maximum and minimum south of Boston being 7.02 miles and 1.37 miles. Many reduced-rate tickets are sold, mainly to accommodate regular travel of comparatively large volume.

The schedules considered apply somewhat different treatment to the urban and suburban lines, as distinguished from the interurban. In nearly all of the cities a new inner zone of greatly restricted area is created, the radius being between 1.5 and 2 miles. Outside, but usually within the free transfer territory a second zone averaging about 1 mile in width is created. Under the schedule (No. 77) as filed, the fare within the inner area is 6 cents, with free transfer privileges at the center, no reduced rate tickets being sold. The cash fare between any point in the outer zone and any point in the inner zone is 8 cents, but six tickets are sold for 45 cents.

The compromise schedule restores the 5-cent rate, by the use of tickets, for rides within the inner area which do not extend beyond the center, and the 7.5-cent ticket to and from points in the outer zone, with transfer privileges, is superseded by a 7 1/7-cent ticket without transfer privileges. The agreement between the company and the communities, which was outlined previously in the ELECTRIC RAILWAY JOURNAL, also describes the practice, new to Massachusetts, of charging less than the regular rate in the off-peak hours, when traffic is slack. These are:

Six tickets for 25 cents, good only on local rides to and from the center of the first zone, without transfers or through rides.

Four tickets for 25 cents, good in the same manner to the center of the first zone from the second zone.

In general, these off-peak tickets will be good from 9 a.m. to 4.30 p.m. (to 6.30 p.m. Saturdays), but not good at other times or on Sundays and holidays.

The Chelsea zone has been elongated to reach to Scollay Square terminus in Boston, and on the line between Boston and Lynn, through Chelsea, the schedule (No. 77) provides for tickets sold at the rate of eight for $1, where the cash fare would otherwise be 18 cents, in order to meet steam railroad competition.

Another schedule before the commission, No. 75, covers the interurban lines outside the city zones and in general follows the "copper zone" plan with rates varying according to traffic density. Out of 403 miles of main track outside the outer city zone, the rate is 2 cents on 249 miles, 2.5 cents on 37 miles and 3 cents on 117 miles.

The third schedule before the board, No. 62, eliminates all reduced-rate tickets which the company deems unnecessary and attempts to place the remainder on a uniform basis. Forty-nine such tickets out of seventy-three are retained, their use being confined to the rush hours and the rate is made 70 per cent of the regular cash fare.

The company estimated that the three schedules would add $2,021,000 annually to its revenue, an increase of 19.8 per cent upon the 1917 gross income within Massachusetts; and that the compromise plan will reduce this increase to $1,671,000.

THREE INCREASES SINCE 1916

Since September, 1916, the company has been permitted to raise its fares in Massachusetts on three occasions, the average increase in rate being about 20 per cent. While provision was made in the city districts for the sale of twenty tickets for $1, in practice less than 30 per cent of the riders in these districts used these tickets. The total gain expected from the three increases was about $1,120,000. The gain in 1917-1918 under the increased rates was at the rate of $863,359 for a year, which was hardly more than might have been expected from two years' increase in traffic without any change in fares. Traffic fell off last winter on most Massachusetts lines owing to severe weather and service reduction. The Bay State company estimates that about 34,000 men in its territory have gone into the army and that the loss in revenue resulting exceeds $300,000 a year. War activity has led to influx of population at certain points, and the company's final conclusion is that all three increases added about 8 per cent, or $792,000 a year, to the revenue.

Last May wages were increased $65,000 by 1916 agreement. Early this year the company agreed to pay its employees in addition a special war bonus of about $300,000 a year. Effective June 10, the men are to receive an additional $750,000 a year. Operating expenses have risen from 18.72 cents per car-mile in 1914 to 29 cents in 1918. The estimated total charges for 1918 are $12,710,255 and the estimated gross income, $10,507,488.

After discussing what the company has achieved in the way of operating economies and possible sources of increased revenue, the commission concludes that the main reliance must be placed upon an increase in passenger fares. The city lines were responsible for 15.74 per cent of the 1917 income deficiency and the country lines for 84.26 per cent. Under the compromise plan the city lines will produce 63.77 per cent of the desired increase and the country lines 36.23 per cent. Under Schedule 77 the commission is of the opinion that the fares fixed by the company are high in relation to the areas established in the inner zones. The minimum fare in the larger cities for a 3-mile ride from the center would be 7 1/7 cents in the rush hours and 6¼ cents in the off-peak hours, even under the compromise plan, and in some instances it would be 10 cents, where the limit of the outer zone is less than 3 miles from the center. The only advantages which the larger cities have over Woburn, Gloucester and the Hyde Park district of Boston lie in the 5-cent tickets in rush hours and the 4 1/6-cent tickets in off-peak hours, available for short-haul rides.

RELATION OF PUBLIC CONTROL ACT TO FARE SITUATION

Under the Bay State public control act, recently passed, the property (if the act is accepted by the company, as it probably will be) will be taken over by a new company capitalized on such a basis that the annual interest and dividend charges (computing common stock dividends at 6 per cent) will not exceed 6 per cent upon the amount found by the commission in 1916 to be the rate base, plus subsequent additions and improvements. New capital is to be furnished, partly by the security holders and partly through the issue of serial bonds in effect guaranteed by the State, any resulting burden being distributed proportionately upon the cities and towns served. To this extent the credit of the State will be placed behind the company.

The decision reviews other features of the Bay State act as previously published in the ELECTRIC RAILWAY JOURNAL, and points out that the legislation passed meets the requirements of the company to an extent probably not anticipated at the time of the hearings. It re-establishes the company's credit, relieves the company from burdens in relation to amortization charges, depreciation allowances, and contributions toward highway and bridge work, etc., so as to prevent fares from reaching an unduly high level during the period of the war. The trustees to be appointed by the Governor will have full control of rates, but as this control will probably not be assumed before au-

tumn, the commission feels that the decision in the pending case could not be postponed with propriety.

With respect to the proposed rates on rural interurban lines covered by Schedule 75, little question can be raised. The decision holds that the copper zone system is logical in conception and deserves a fair trial. In deciding whether the rate on a particular line should be 2, 2.5 or 3 cents per mile, certain rather arbitrary distinctions have been made, but the higher rates have not been applied to lines where the traffic would justify a lower rate.

CITY ZONES COVER THICKLY-POPULATED DISTRICTS

Schedule 77, relating to the city districts, raises more difficult questions. If it were not for the increase of $750,000 a year in wages the commission would be disposed to require radical changes. Taking into consideration the financial benefits to be derived from the new legislation, the burden imposed upon the city districts under this schedule would, in the opinion of the commission, be unjust as the situation stood prior to the granting of the last wage bonus. This wage increase is nearly half the sum the company expects to derive from the new compromise schedule. The commission concludes that no change need be made at this time. The zone system of fares proposed within the city districts seems to be better adapted to the urban territory in which the company operates than to the similar territory served by certain other street railways. In the main, the cities are compact, the thickly-settled portion falling largely within the inner zone limits. There seems to be a general feeling that the preservation of a 5-cent rate for short-haul traffic within the central areas and the experimental introduction of a still lower rate during the off-peak hours compensate in substantial measure for the disadvantages of the zone plan, and will offer an opportunity to test the effect of low charges in inducing extra riding.

Regarded from this point of view, the new schedule is an attempt to confine the inner zone within which the minimum fare is charged to the limits of the thickly-settled portion of a city, rather than an attempt to reduce it to an arbitrary circular area with a radius of about 1.5 miles; and for this reason the precedent established is in the commission's opinion less undesirable and dangerous to the public interest. As the short-haul offsets the long-haul riding in city traffic, the central single-fare area may often, without detriment to earnings, be made larger than would appear possible.

In regard to Schedule 62, dealing with the so-called "workingmen's tickets," the chief question is whether these should be provided more generally. The commission does not feel called upon to suggest additional applications under present conditions in a sweeping manner, but reserves the right upon petition to take up particular cases, and its attitude is the same with regard to zone limits. The board feels that the new 7 1/7-cent tickets, taking the place of the 7½-cent tickets, should be used in connection with through rides to or from interurban territory beyond the outer zone. Otherwise through riders would have to pay the 8-cent cash rate and would thus be worse off under the compromise plan than under the original schedule. With minor modifications, the commission is prepared to approve a new schedule tentatively prepared as Bay State Tariff No. 78, combining and superseding those before the board, which are now canceled by the commission.

What Virginia Cases Portend

The favorable action by the Corporation Commission of Virginia in connection with the recent fare application of the Charlotteville & Albemarle Railway and the Lynchburg Traction & Light Company, both of which have been referred to recently in the ELECTRIC RAILWAY JOURNAL, is regarded to have been influenced by the conference which the committee representing the public utilities of Virginia held with the Corporation Commission the latter part of April. At the end of that hearing the chairman of the commission indicated that a statement would possibly be issued setting out in a general way the attitude of the commission, but up to June 6 this had not been done. The attitude of the commission, however, is apparently to consider the applications in the nature of a war emergency, for so far as the records are available they show that all of the grants of increases have been limited to Nov. 30, 1919.

Transportation News Notes

Illinois Road Would Raise Fares.—It has been announced that the Chicago & Joliet Electric Railway, Joliet, Ill., will petition the Public Service Commission of Illinois for an increase from 5 cents to 7 cents on all city lines and an increase of one-half cent a mile on the interurban lines.

A Two-Page Publicity Spread.—In connection with its application to the Illinois Public Utilities Commission for a 7-cent fare, as noted recently, the Alton, Granite & St. Louis Traction Company published in the Alton daily papers a two-page advertisement setting out in full why a higher fare is needed. This will be followed by smaller advertisements dealing with particular phases of the situation.

Electrics Seek Increase of Interstate Rates.—Increases in both passenger and freight rates to conform with the 25 per cent advance for roads under federal control was asked of the Interstate Commerce Commission on June 15 by the Ohio Electric Railway. The Terre Haute, Indianapolis & Eastern Traction Company has also filed an application for increase in fares between points on its line in Indiana and Illinois to the basis of 2½ cents per mile.

Folder on Fares and Service.—The New York (N. Y.) Railways has issued over the signature of T. P. Shonts, president, an eight-page folder 6 in. wide by 9 in. high entitled "Street Car Fares and Street Car Service." It contains a list of 6-cent fare cities, zone fare cities, cities in which fare appeals have been made and extracts from statements made about the public utilities by Comptroller of the Currency Williams, Secretary McAdoo and President Wilson.

Transportation of Soldiers a Question.—As a result of a campaign by the Hearst papers of Chicago, the City Council of that city has referred to the committee on local transportation the question of requesting the surface and elevated lines to carry men in the uniform of the United States Army, Navy and Marine corps without compensation. The railways have not as yet made any statement as to what action they will take if such a request is made. It is expected that the matter will come up for decision at an early date.

Skip Stops at El Paso.—The El Paso (Tex.) Electric Company announced that the skip stop would be introduced on June 5 on the Fort Bliss, Highland Park and Government Hill lines which have no direct jitney competition. The stops are located every other block, averaging six or seven to the mile. Stop signs are hung from the span wires. Announcement of the change was made in the newspapers. It was planned to allow one day's grace in accustoming riders to the change by advertising to them in the cars on June 5 substantially as follows: "We stopped to pick you up to-day, but hereafter the skip-stop rule will be rigidly enforced. Better take the right corner!"

Workingmen's Tickets to Go.—The International Railway, Buffalo, N. Y., has filed with the Public Service Commission for the Second District of New York, a new tariff schedule to go into effect on July 1. It is proposed to discontinue the sale of tickets in strips of ten for 25 cents, good for use between points within the city of Niagara Falls between the hours of 6 and 7 a.m. or between 6 and 7 p.m. The tickets will not be accepted for passage on and after July 1, but unused portions will be redeemed on a basis of 2½ cents per coupon. The proposed change effects an increase.

Five-Cent Fares the Rule.—E. I. Lewis, chairman of the Public Service Commission of Indiana, has announced the granting of a straight 5-cent fare to the Louisville & Southern Indiana Traction Company, which operates in New Albany and Jeffersonville. This practically completes the institution of straight 5-cent fares in the larger cities

of the State by the commission as a war-time relief measure. In Indianapolis this relief could not be granted as the company did not surrender its franchise. The case of the railway there must be passed on by the Supreme Court before the commission can act.

Modification of Zone Charge—The Peekskill Lighting & Railroad Company, Peekskill, N. Y., according to a schedule filed with the Public Service Commission for the Second District, has reduced its fare from 7 to 5 cents between any two stops within zone 2, in line division, northeast of Locust Avenue to and including Lake Mohegan, and between any two points within zone 3, Verplanks division west of Montrose to and including Verplanks. Monthly commutation tickets good for fifty-four rides between Verplanks and the corner of the Albany Post Road and Welcher Avenue will be sold for $3.78. This is a new fare.

Fare Protest Served on Company.—The Public Service Commission for the Second District of New York has served upon the United Traction Company, Albany, the complaint of Mayor McIntyre of Rensselaer against the company's proposal to increase the Rensselaer-Albany fare to 6 cents with no transfer. It is expected the complaint will be heard upon the hearing of the suspended schedule of the company increasing interurban rates affecting Albany, Troy, Cohoes, Green Island and Waterford. The date has not been fixed. The complaint claims the rate of fare between Albany and Rensselaer is fixed at 5 cents by the laws of 1905.

Wants to Apply Steam Rates.—The Joplin & Pittsburg Railway, Pittsburg, Kan., which recently was authorized by the Public Service Commission of Kansas to charge 2 cents a mile in that State outside of towns, has now petitioned the commission for permission to charge 3 cents a mile. Besides asking an increase to 3 cents a mile for passenger fares, the company wants a flat raise of 25 per cent in freight rates to conform to the advances allowed the steam railroads. A hearing will be held before the commission during the week commencing July 2. The matter of fares over the line was reviewed briefly in the ELECTRIC RAILWAY JOURNAL for May 11, page 935.

Portland Jitneys Prepare for Comeback.—It is expected that jitneys will be operating shortly in Portland, Ore., under the provisions of the new bonding act approved by the voters at the recent city election, noted in the ELECTRIC RAILWAY JOURNAL for June 1, page 1065. E. W. Rossman, president, secretary and treasurer of the Jitney Bus Union, states that sufficient numbers of men have been enrolled in the United Motor Bus Association to insure the operation of jitneys under a blanket bond of $10,000, and securities in the form of Liberty bonds will be deposited with the city treasurer in the near future. One hundred men will deposit $100 each to make up the necessary amount.

Violation of Traffic Orders Charged.—The Public Service Commission of Maryland has adopted a resolution directing its general counsel to commence an action against the United Railways & Electric Company, Baltimore, for the purpose of having alleged violations of the order of the commission dated Feb. 18, 1918, and other service orders covering overcrowding, etc., prevented by mandamus or injunction. About two years ago the commission adopted rules regarding the crowding of the cars. Since that time there have been many complaints alleging violations of the rules. Some months ago the company petitioned the commission to make modifications. The commission did so. It has since been charged that the company has not lived up to the letter of the modified orders.

Grand Jury Reports on Women Employees.—A special Grand Jury which for several weeks had been investigating complaints as to the conditions surrounding the employment of women as conductors and guards on the surface and subway lines of the Brooklyn (N. Y.) Rapid Transit Company on June 17 handed in a presentment to County Judge McDermott charging the company with "inexcusable neglect" in failing to cause a careful investigation to be made of the character of each woman applying for work. The conditions, the Grand Jury finds, are such as to make the conduct of a few reflect upon the many decent and self-repecting women employed by the company and should be remedied forthwith. The company regards the finding of the Grand Jury as "primarily a tribute to the high standing and character of the great majority of the patriotic and courageous women in our service."

Professor Richey on Rate Inquiry Board.—Prof. Albert S. Richey of Worcester Polytechnic Institute has been appointed a member of a special commission to decide whether the New Brunswick Power Company, St. John, is entitled to increase its railway fares and rates for electric light, power and gas. His colleague on the commission will be Le Guy W. Currier, Boston, Mass. A bill introduced in the New Brunswick Legislature to authorize the New Brunswick Power Company to advance its electric railway fares and its rates for gas and electric current was defeated owing to opposition by St. John citizens and newspapers, but a bill introduced at the city's instance was passed, providing for an investigation of all the company's property, franchise rates, etc., with the proviso that the commission to be appointed under it may grant temporary relief, if it is satisfied that the same is necessary.

Mr. Cobb Retorts—Numerous criticisms in the daily papers of the suggestion by John T. Cobb, the Boston banker, that the New York traction companies abandon night service to save expenses have led him to reply that his suggestion was made only because economies had to be effected and he thought that it would be less inconvenient to a smaller number of people for the companies to shut off night service than to curtail day service, but any more satisfactory plan would be welcomed by the managements and undoubtedly also by the Public Service Commission. The metropolitan press seems now to have a better understanding of the subject. The New York *Sun* in a recent editorial said: "Radical cutting down of the city's transportation lines is impossible, if we are to remain efficient. It cannot be done. If the transit companies absolutely need higher fares, we will pay them."

East St. Louis Company Would Increase Rates.—The East St. Louis (Ill.) Railway announced by advertisement in the daily newspaper on June 18 that it was filing with the Public Utilities Commission and the Interstate Commerce Commission tariffs for increased fare from 5 cents to five tickets for 30 cents (7 cent cash fare) on all East St. Louis city lines, and for increased fare from East St. Louis to St. Louis from 10 cents to five tickets for 55 cents (12 cents cash fare). The East St. Louis Railway owns and operates the cars which operate over the East St. Louis city tracks, but the East St. Louis & Suburban Railway and the Alton, Granite & St. Louis Traction Company also carry city pasengers on interurban cars. All three companies will be affected in so far as the rate of fare affects passengers whose destination is anywhere within the city limits, but the East St. Louis Railway is the company which will be principally affected by the increase. The company incorporated as part of its announcement the estimated results of the increase as affecting the East St. Louis Railway. It also presented data on the need of the increase.

Schenectady Fare Appeal.—Horace E. Andrews, president, and J. P. Barnes, general manager, representing the Schenectady (N. Y.) Railway conferred recently with the Public Service Commission for the Second District. They asked if the commission was willing to take up the Schenectady fare question and Chairman Hill informed them that the commission would take the same position it has taken on fare questions in Buffalo and White Plains, namely that unless jurisdiction is legally conferred upon the commission so that it could make a binding order, the commission cannot see its way to act. A move to secure the necessary action of the city has since been made in connection with the settlement of the strike referred to on page 1201 in this issue of the ELECTRIC RAILWAY JOURNAL. The hearing of the petition of the company for annulment of existing orders of the commission requiring the sale of round-trip tickets between Schenectady and Albany and Troy and also between Schenectady and Ballston Lake was adjourned by the commission on June 18. The railway is to file new tariffs at once covering proposed rate changes and then the commission will hear the evidence on the company's petitions to annul and also the necessity for rates under the new tariff.

Personal Mention

H. H. Lyons, superintendent of the Ordway division of the Arkansas Valley Railway, Light & Power Company, Pueblo, Cal., has enlisted in government service, and will take special training at Fort Collins.

Henry Hoffer has been appointed chief instructor of the Washington Railway & Electric Company, Washington, D. C. Mr. Hoffer succeeds E. C. Elliott, who becomes assistant superintendent of transportation of the company.

J. J. Stanley has been elected president of the Syracuse & Suburban Railroad, Syracuse, N. Y., succeeding W. J. Harvie, who remains as general manager and a member of the board. Mr. Stanley is president of the Cleveland (Ohio) Railway.

Arthur W. Warner, head of the real estate department of the Interborough Rapid Transit Company, New York, N. Y., has obtained an indefinite leave of absence and will enter the government service to assist in the buying, commandeering, and valuation of property for the army and navy.

E. C. Elliott, chief instructor of the Washington Railway & Electric Company, Washington, D. C., has been appointed assistant superintendent of transportation of the company. Mr. Elliott graduated from the platform of the old horse car and has been in the service twenty-five years. He passed through the stages of conductor, starter, clerk, inspector and instructor. In the latter capacity he succeeded W. F. Dement in charge of the company's school.

William F. Dement has been appointed superintendent of transportation of the Washington Railway & Electric Company, Washington, D. C., in which capacity he has been acting for some time. Mr. Dement began his railway career with the Columbia Railway in 1890, as a driver of a one-horse car and was advanced to clerk and then supervisor. In 1900, when the road became a part of the system of the Washington Railway & Electric Company, he was promoted to depot clerk and later to inspector. He organized and conducted the school for instruction of motormen and conductors.

F. H. Williams of the Manitoba *Free Press* has succeeded H. C. Howard as publicity agent for the Winnipeg Electric Railway, Mr. Howard having joined the business staff of the Vancouver *Sun*. Mr. Williams is well known in Western Canada, having been connected with the Winnepeg *Telegram*, the Edmonton *Capital* and the Edmonton *Bulletin* during the past six years. He has only recently returned from France where he served ten months in the trenches with the Forty-second Battalion of Montreal. Mr. Williams had his left leg shattered by an explosive bullet in the battle of Vimy Ridge, on April 9, 1917, and spent nine months in a hospital before being sent back to Canada.

Leslie Sutherland, vice-president and general manager of the Yonkers Railroad, has been elected second vice-president of the Third Avenue Railway, New York, N. Y., which controls the Yonkers Railroad. Mr. Sutherland began his railroad career in 1908, when he was appointed receiver of the Yonkers Railroad. After the receivership was lifted in 1912 Mr. Sutherland was elected vice-president and general manager of the company, which position he continues to hold in addition to his new office with the Third Avenue Railway. Despite the tightened conditions of the money market when Mr. Sutherland was made receiver of the



LESLIE SUTHERLAND

Yonkers Railroad he succeeded in borrowing $600,000 on receiver's certificates, practically rebuilt the road, restored it to public prestige and doubled the receipts in four years. Mr. Sutherland has had a wonderful career of achievement. He left school when twelve years of age. He held several minor positions and then began the study of law. On account of ill health he was obliged to give up office work and became an apprentice bricklayer. While serving in this trade he entered Cooper Union, New York, taking the course in the school of science and art. It seems now rather singular that one of the buildings on which Mr. Sutherland worked as foreman of construction was the cable house of the Third Avenue Railway on the Bowery, of which property he now becomes vice-president. In addition to his business interests, Mr. Sutherland has been prominent in public life, being twice elected Alderman, serving twice as president of the Board of Aldermen and later as Mayor of Yonkers. He was twice elected county clerk of Westchester County. Mr. Sutherland has also represented the Republican party in ward, city, county, State and national conventions. Throughout all Yonkers and Westchester County Mr. Sutherland's name is a household word. He is Yonkers' favorite son.

K. B. Conger, assistant secretary and assistant treasurer and real estate manager of the Hudson & Manhattan Railroad, New York, N. Y., has been appointed by the Director General of Railways general manager of the company in charge of the operating affairs of the railway.

J. C. Moore has resigned as auditor of the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., to accept a similar position with the Chicago, South Bend & Northern Indiana Railway, and the Southern Michigan Railway, South Bend, Ind. Previous to his position with the Chicago, North Shore & Milwaukee Railroad, Mr. Moore had been auditor of the Oklahoma Railway, Oklahoma City, Okla., and assistant auditor for the Union Traction Company of Indiana, Anderson, Ind.

C. A. Hall has been appointed manager of the electric light and power department of the Eastern Pennsylvania Railways, Pottsville, Pa. Mr. Hall was employed in 1904 by the Consolidated Light Company, Huntington, W. Va. In 1907 he went with the Ohio Valley Electric Railway, Huntington, W. Va. He became superintendent of the Canonsburg Electric Light, Heat & Power Company, Canonsburg, Pa., in 1909, and following the purchase of this utility in 1911 by the West Penn Power Company, Pittsburgh, Pa., he was appointed local manager of that corporation in charge of the Canonsburg territory. Under Mr. Hall's management this property was entirely rebuilt and many improvements made to the service.

W. B. Atwood, formerly general superintendent of the Wheeling (W. Va.) Traction Company, has become safety engineer with the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. The accident expenditure of the company at Youngstown is considered too high by the officers, and to Mr. Atwood will be intrusted the work of studying accident prevention on the property and then adopting such corrective measures as may suggest themselves to him as applicable. Before going to Wheeling in 1916, Mr. Atwood was vice-president and general manager of the Geneva, Seneca Falls & Auburn Railway, Seneca Falls, N. Y. He was graduated from Cornell University, and has had considerable steam railroad experience in addition to his electric railway work.

C. C. Coulthard has been appointed assistant superintendent of the lines of the Mahoning & Shenango Railway & Light Company in New Castle, Pa. Mr. Coulthard became connected with the New Castle Traction Company, the predecessor of the Mahoning & Shenango Railway & Light Company, on

May 3, 1900, but began his career in 1892 on an electric line which was operated by the Pennsylvania Railroad from Ellwood City to Ellwood Junction. He was a conductor for two years on this line. Later he went to the Shelby Tube Works. When Mr. Coulthard entered railway work in New Castle the company was under the general managership of Gaylord Thompson. He continued on through the administrations of A. A. Anderson, M. E. McCaskey, W. C. Smith and G. J. A. Paul and into the present management.

W. J. Grambs, formerly superintendent of light and power of the Puget Sound Traction, Light & Power Company, Seattle, Wash., has been appointed supervisor of the Sea Training Bureau of the United States Shipping Board for the Pacific Northwest. He will have charge of the receiving station in West Seattle and the training ships *Iroquois* and *Chippewa* recently taken over by the government. These duties will be performed in addition to his work as section chief of the recruiting service of the Shipping Board for Washington and Oregon noted some time ago. Mr. Grambs entered government service on Sept. 1, 1917, and has had charge of the navigation schools in Seattle, Tacoma, Portland and Bellingham and the marine engineering school at the University of Washington. John Harsberger holds the position formerly held by Mr. Grambs.

Obituary

S. M. James, assistant superintendent of transportation for the Kansas City (Mo.) Railways, died suddenly at his home on May 19. Mr. James had been with the company at Kansas City for the last eighteen years as a member of the transportation department.

Capt. Frank W. Hulett, engineering corps, American Expeditionary Force, was recently reported killed in action in France. Captain Hulett was thirty-five years of age. He was graduated from Yale University in 1908. He was in the service of the government for two years in the Philippines, and for five years was electrical engineer of the Lewiston, Augusta & Waterville Street Railway.

Charles F. Freeman, aged seventy-two years, organizer and former president of the Dallas (Tex.) Rapid Transit Company, which was later sold to Stone & Webster, died at his home in Dallas on May 31. Mr. Freeman as president and manager of the Rapid Transit Company, now known as the South Bend Line and consolidated with other companies under the Strickland-Hobson franchise, is said to have brought the first electric street car to Texas. Mr. Freeman continued as president of the Rapid Transit Company until 1902, when the property was sold to Stone & Webster.

Construction News

Construction News. Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

Franchises

Los Angeles, Cal.—The Board of Public Utilities of Los Angeles has approved the application of the Los Angeles Railway for a franchise over Country Club drive to the new high school. The company is prepared to extend the Eleventh Street line at once.

Hamden, Conn.—The Connecticut Company has received an extension of time on its franchise to construct a line in Hamden from the Dixwell Avenue terminus to Centerville, passing through Highwood and connecting with the Whitney Avenue line.

New York, N. Y.—The New York & North Shore Traction Company has asked the Board of Estimate for the right to abandon its franchise for the two lines extending from Flushing to Whitestone and Little Neck. A public hearing on the application was scheduled to be held in Flushing on June 21.

Philadelphia, Pa.—The finance committee of the City Councils of Philadelphia has refused to approve an ordinance providing for a new contract between the city and the Frankford, Tacony & Holmesburg Street Railway, relative to bearing the costs of keeping Frankford Avenue in repair. The city, however, will spend $60,000 for that purpose as an emergency war measure.

Seattle, Wash.—The application of the Puget Sound Traction, Light & Power Company for relief from its franchise obligations during the period of the war has been referred by the Mayor of Seattle to a committee of two Councilmen and Thomas F. Murphine, superintendent of utilities.

Track and Roadway

Pacific Electric Railway, Los Angeles, Cal.—An extension to Yucaipa will be built by the Pacific Electric Railway as soon as possible.

Chatham County Traction Company, Savannah, Ga.—The Railroad Commission of Georgia has granted the Chatham County Traction Company authority to issue $150,000 capital stock. The company is building a line from Savannah to Port Wentworth. (April 27, '18.)

United Railways & Electric Company, Baltimore, Md.—Several lines of the United Railways & Electric Company will be rerouted, necessitating the building of several short connections.

Detroit (Mich.) United Railway.—In conjunction with the new car line now under construction, connecting Ferndale and Dearborn Avenues, the Detroit United Railway will build an additional line to the northerly end of the Ford shipbuilding plant on the River Rouge, north of Fort Street. The new line, which will be double-tracked, will connect with the new Ferndale line at Dix Avenue and extend north 1 mile on the east side of the Pére Marquette Railroad. The company will spend approximately $500,000 in constructing these two new lines, and most of the track will be on private right-of-way.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—Officials of the Trenton & Mercer County Traction Corporation and members of the Board of Public Utility Commissioners of New Jersey recently held a conference relative to the construction by the company of an extension to connect the West State Street and Trenton Junction lines and the Pennsylvania Railroad Company's tunnel and subway under the Delaware and Raritan canal near the State Hospital. Rankin Johnson, president, said his company was ready to proceed with the work of building the new road. The traction company will have to cut its tracks to permit the Pennsylvania Railroad to complete its tunnel and subway improvements. The tracks will have to be relaid at a new grade. The company has asked the commission for permission to remove the tracks from a private right-of-way on a portion of the Trenton Junction line. The tracks on the Trenton Junction line near the State Hospital woods were recently damaged by a washout.

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District of New York has requested the Brooklyn Heights Railroad, a subsidiary of the Brooklyn Rapid Transit Company, to change its track layout in Long Island City so as to accommodate larger cars of the Graham Avenue line, which was recently extended over the Vernon Avenue bridge to Long Island City.

New York (N. Y.) Railways.—A public hearing will be held on July 14 in the Board of Estimate chamber on the matter of changing the tracks of the New York Railways on Central Park West from the east side to the center of the street.

Poughkeepsie City & Wappingers Falls Railway, Poughkeepsie, N. Y.—The memorandum of Commissioner Hill of the Public Service Commission for the Second District of New York in

the decision permitting the Poughkeepsie City & Wappingers Falls Electric Railway to charge a 6-cent fare specifically details improvements which are to be made by the company. These include the replacement of 5384 ft. of single track in Main Street with double track, reconstructing 12,461 ft. of track on the South Side line, repairing track, securing two additional cars for the Wappingers Falls division, to repair and properly clean cars, replace wires and poles, install automatic block signals, reroute and make other improvements tending toward safety of operation, convenience of passengers and better service.

Chillicothe & Camp Sherman Electric Railway, Chillicothe, Ohio.—The Public Utilities Commission of Ohio has approved the steps which are looked to for securing of traction service from Chillicothe to Camp Sherman. The commission approved the joint application of the Chillicothe & Camp Sherman Electric Railway Company and the Chillicothe Electric Company for authority to transfer property to the new company, the Chillicothe & Camp Sherman Electric Railway Company. The price to be paid for the property transferred to the new company is $270,800, which is to be met by transfer of securities of the new company, $50,800 of common capital stock, $120,000 7 per cent preferred stock and $100,000 6 per cent mortgage bonds. (June 1, '18.)

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—Operation has been begun by the Mahoning & Shenango Railway & Light Company on its 3-mile extension to East Hill and Buhl Park, Sharon.

London & Lake Erie Railway & Transportation Company, London, Ont.—An offer has been made by the London & Lake Erie Railway & Transportation Company whereby the city of St. Thomas may acquire the south end of the line running between St. Thomas and Port Stanley for approximately $150,000.

Toronto (Ont.) Suburban Railway.—This company will install a safety switch at the intersection of Lansdowne Avenue and Davenport Road.

Southern Pacific Company, Portland, Ore.—A plan has been formulated in Portland whereby special trains operated by the Southern Pacific Company, with transfer privileges to all city lines of the Portland Railway, Light & Power Company, may be operated for the benefit of shipyard workers in South Portland, and the plan will be submitted to the government and railroad officials. The plans were formulated by Edward M. Cousins, traffic expert, who says they have the approval of representatives of the Shipping Board, and the special committee of the City Council appointed by Mayor Baker to devise means for handling special problems pertaining to public utilities in Portland. A similar plan has been worked out for shipyard workers in the East Side, Peninsula District, St. Johns and Vancouver, providing for operation of trains by the Oregon-Washington Railroad & Navigation Company with transfer privileges to city lines. Three yards in that vicinity employ 7000 men, who are compelled at this time to walk eight blocks up a steep incline to reach street cars. A plan is also under way to place broad-gage street cars on the Southern Pacific electric lines, running near the three shipbuilding plants.

Seattle (Wash.) Municipal Railway.—A contract has been awarded to Geske & Company, Seattle, at $16,186 for furnishing labor, material, etc., for the elevated line along East Marginal Way and West Spokane Street. The committee appointed by the Board of Public Works, Seattle, has decided upon a 20-ft. vertical clearance, an 18-ft. horizontal span, 9 ft. from the center of the track to the elevated track supports, as the specifications for clearances for the railroad tracks under the city's elevated railway to the industrial district in the southern part of the city. The railroads have agreed to these specifications, and the Board of Public Works has adopted the committee's decision.

North Coast Power Company, Vancouver, Wash.—The Public Service Commission of Washington has instructed the North Coast Power Company to install an electric signal service on the line from the Cowlitz, Chehalis and Cascade office on Pacific avenue to Eleventh Street. One block will be placed at the office, another on John Street and the third at Eleventh Street.

Shops and Buildings

Lake Shore Electric Railway, Cleveland, Ohio.—Negotiations have been opened by the Lake Shore Electric Railway with the Sandusky Brick Company for the leasing of part of the old Goosman property on Wayne Street for a package station. It is understood that the company will use the north side of the building for the station. Loading platforms sufficiently long enough to handle several cars will be built and a spur run in from Wayne Street to enable the cars to reach the platform.

Ohio Electric Railway, Springfield, Ohio.—Plans have been prepared by the Ohio Electric Railway for the removal of its carhouse, repair shops and storage house from Columbus to Springfield. Ground has been purchased for the new building in West North Street. The contract for the construction of the storage house has been awarded to the Concrete Steel Construction Company. Contracts for other buildings have not been let.

Oregon Electric Railway, Portland, Ore.—A report from the Oregon Electric Railway states that it will purchase within the next few days one 13-in. brass finishing lathe, one ¾-in. plate binding roll, one double-end punch and shear and one 42-in. wheel lathe.

Power Houses and Substations

Alabama Power Company, Anniston, Ala.—The 90-mile transmission line of the Alabama Power Company from the power plant in Walker County to the government development work at Muscle shoals has been completed. The company is now building a 30,000-kw. extension to its Warrior reserve steam plants, which is to be completed by Oct. 1.

New Orleans Railway & Light Company, New Orleans, La.—The economizer and boiler in the central power plant of the New Orleans Railway & Light Company, at Market and South Peters Streets, recently exploded from unknown causes. It was estimated that the plant was damaged in excess of $50,000.

Union Street Railway, New Bedford, Mass.—Work on the new $1,000,000 power house of the Union Street Railway at the foot of Middle Street is progressing steadily, most of the steel framework being erected. It is expected that the concrete chimney, which will be 220 ft. high, will be completed within the next couple of weeks.

Albany (N. Y.) Southern Railway.—Of an issue of $2,151,000 of first refunding mortgage thirty-year 6 per cent bonds, recently authorized by the Public Service Commission for the Second District of New York, $190,683 will be used by the Albany Southern Railway for new construction. The new work proposed includes new crib work on the Albany-Greenbush bridge, additional transmission line, additional power facilities in Rensselaer and gas mains.

Pacific Power & Light Company, Astoria, Ore.—The construction of a new power transmission line has been completed by the Pacific Power & Light Company from its local system to a connection with the lines of the Northwestern Electric Company at its conduit plant on the White Salmon River, a distance of about 7½ miles. The line provides for an interchange of power between the Pacific Power & Light Company, the Northwestern Electric Company and the Portland Railway, Light & Power Company. The Pacific Power & Light Company has installed a new feeder panel for motor load control at its Toppenish substation.

Rutland Railway, Light & Power Company, Rutland, Vt.—New additions and extensions to its transmission system are being considered by the Rutland Railway, Light & Power Company to provide for increased capacity.

West Virginia Traction & Electric Company, Morgantown, W. Va.—Work has been begun by the West Virginia Traction & Electric Company on the erection of a new transmission system from Morgantown to Masontown to supply energy to the plant of the Elkins Coal & Coke Company.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES · MARKET QUOTATIONS · BUSINESS ANNOUNCEMENTS

Enormous Increase in Consumption of Wire

Railways Are Buying, But Official Requirements Dominate the Market—Rubber Supply Sharply Curtailed

Unless reports are misleading the demand for copper is growing steadily. The supply is variously stated as sufficient for all purposes and again a shortage is in sight. Perhaps these views are colored by the attitude of the people expressing them toward the market and also possibly by price considerations. At any rate wire and cable manufacturers, referring to their output of electric railway goods, state copper is difficult to obtain. Sellers are not numerous, and it appears as if the fixed governmental price is mentioned as too low. Consequently if an advance can be obtained a disposition to hold on to the metal with the hope of realizing a higher profit from commercial users, at least, is not surprising. Possibly this and other phases of the situation received consideration at a meeting of the producers with the sales managers of copper selling companies in New York on Tuesday. The distribution of supplies was discussed, but not a word on the price situation was disclosed.

Deliveries have also hampered the operations of the wire and cable plants. Even on government orders the delays occasioned by wrong routing and sidetracking of copper pressingly needed to fill orders has hindered the shipment of finished goods materially. Five cars of copper coming to a New York cable manufacturer from a near-by Southern point took more than five weeks to reach its destination. Of the great quantity of wire and cable used for power-house transmission and also for railway lines it is said the consumption has risen enormously since the first of the year, the majority of manufacturers reporting vastly increased sales.

The amount of wire goods sold during the last few weeks was about 75 per cent higher than in January. This ratio is being maintained. According to the statement of a large manufacturer the price of wire may not go up, but it certainly would not be lowered.

The consumption of rubber by rubber-covered, cable and weatherproof wire manufacturers has been curtailed by governmental restriction on its importation to about seven-tenths of what is usually called for. Furthermore, manufacturers' requirements and the use to which the material is to be put must be given in detail and every stage of the process and the ultimate destination and purpose of the finished article must be furnished. The prices fixed by the government, after placing rubber on the restricted import list which went into effect on May 1, as previously mentioned in the ELECTRIC RAILWAY WAY JOURNAL, are on the following scale: 62 cents a pound for standard smoke sheet; 63 cents a pound for standard quality first latex crepe; 68 cents a pound for fine Para, c.i.f. New York.

Producers of rubber-covered wire are displaying some concern over the future outlook for rubber. It is this condition that is beginning to have an effect on prices.

Largest Output of Bituminous Coal in History

Labor Shortage Is a Disturbing Factor and Is Seriously Restricting Production of Anthracite

Bituminous coal production during the week ending June 8 was the largest in history, according to the report of the United States Geological Survey. The soft coal produced (including lignite and that made into coke) is estimated at 12,465,000 net tons an increase over the week of June 1 of approximately 1,900,000 net tons or 17.8 per cent and the same increase over the week of June 8, 1917. The average daily production is estimated at 2,077,000 net tons, considerably in excess of the 1,791,000 net tons during the week preceding and 1,789,000 net tons during the same week of the preceding year.

With a depleted working force the anthracite industry is creating an output of 275,000 tons daily by intensive methods, but this cannot be maintained if further inroads are made in the ranks of the mine workers. Many collieries are now running with from 25 to 40 per cent short of a full force. The constant dwindling of the anthracite miners is now a serious question. It entails decreased production with probable cost increase to some consumers. The labor question seems to be the main disturbing factor to maximum hard coal production at the present time and it is one that should receive the immediate attention of interested officials. Before the war there were 177,000 mine workers in the anthracite industry. The number has been drawn down to about 145,000 now. With such reduced labor power, the existing output of coal is large. It is being accomplished with the aid of the much more highly developed mining facilities.

Trolley and Register Cords Again Advanced

Government Restricts the Importation of Asphalt—Prices to Go Higher—Raise on Cement

Several minor articles in general use by traction companies are either advancing in price or a shortage is impending. Trolley, bell or register cords, which were marked up during the spring, are reported as tightening in price. An advance of 9 cents a pound was made within a few weeks. Shortages of raw material have increased the cost of production of all cords, and there is little to indicate that they will be any cheaper for a long time to come.

The War Trade Board has placed asphalt upon the restricted imports list. Imports for 1918 will be limited to a total quantity of 30,000 tons from Venezuela and 32,000 from the Island of Trinidad. All outstanding licenses for the importation of asphalt are revoked as to shipments made after June 15, Allocation of the amounts permitted to be imported, regulation of the price and other details will be arranged after conference with the War Industries Board.

Asphalt importers, after this official announcement, said it would have no immediate effect on prices, but an advance should be looked for in a short time. It was bound to come as soon as the stocks on hand were depleted. An increase of 50 cents a ton was made last week. Asphalt filler is likely to go higher at the same time.

On June 25 cement will be advanced 8 cents a barrel at all points on carload lots. Contracts now being entered into are being executed on that basis.

Industrial Survey for War Work

Charles A. Otis, recently president of the Cleveland Chamber of Commerce, has been made chief of the new Resources and Conversion Section of the War Industries Board, and has suggested the Cleveland plan as a model for all of the other nineteen regions into which the country has been divided. Under this plan, the Cleveland district, which comprises fifty-four counties in northern Ohio and three in northwestern Pennsylvania, has been divided into eight sub-regions, each with a local war industry commission which reports to the district committee on the possibility of caring for government war orders.

Material for Cars Difficult to Obtain

Manufacturers Frankly Admit Their Anomalous Position—Prices and Promises in Same Class—Labor's Attitude

Priority certificates for the delivery of needed material for the manufacture of railway equipment, rolling stock and supplies are now the all-important consideration in the acceptance of orders. Unless long deliveries on rolling stock are acceptable it seems there is no other way to obtain cars, unless the equipment is directly or indirectly for government use or for the purpose of aiding in the prosecution of the war. A recent order for one-man cars was placed specifying August as the delivery date. The purchasing agent of the company thought he was particularly fortunate in securing the shipment so early. The remark was qualified by the statement that cars of this type are now almost carried in stock. That is to say, some of the builders have standardized the safety car and are therefore in a better position to construct and ship such orders at a definite time.

Another company in the market for a lot of closed double-truck cars, 50 ft. in length, finds that one car builder who was consulted stated his plant's capacity was taken up in the production of gun carriages and he would be unable to fill a rolling stock order under a year and a half. In other words, he would rather not take the order under the circumstances. Of course, other builders are in better shape, and it was ascertained that on this particular lot delivery could be made in October. A priority certificate would probably shorten the time—ninety days being about the period designated.

Snowplow requirements have been delayed this year later than usual; but a number of companies have finally placed orders. Deliveries are specified from September to December. Equipment of this kind is not carried in stock, consequently anticipation must be the rule if plows and sweepers are expected. The drawback is in obtaining material. Price is secondary in almost every instance. The selling agents of a concern in this line have recently been instructed by their factory not to book orders for any equipment unless the buyer is in a position to get priority on getting and delivering the raw material. This applies on everything.

With the government assuming the allocation of steel and iron products the situation is rendered still more uncertain and trying. An inquiry for a quotation on steel fenders a few days ago was met with the reply from the manufacturers that it was impossible to name a figure until the material could be located and delivery was assured. In other words, at present and probably for an indefinite period, shipment of completed orders is too hazy a proposition even to discuss. The curtailment in the supply of steel is rendering a change necessary in the construction of cars. Where steel parts have always been specified, wood is being substituted.

Skilled labor is becoming scarcer. Rather, it is shifting from one industry to another, as higher wages are offered. Possibly the government is planning to control the supply of labor and its distribution, as announced on June 13 by the Department of Labor, and thus may bring relief. Not a manufacturer of railway material or devices but has had his plant's efficiency and production more or less affected. As for wages demanded and paid it is almost beyond belief as compared with the prewar scale. It has also played no small part in the enhancement of prices and uncertain shipping promises. The plan will have its first practical test beginning July 15.

After that date all industries employing more than 100 workers will be compelled to obtain labor through the Federal Employment Service. This restriction will be eventually extended to cover skilled men. "Pirating labor" by bidding high prices for workmen, thus causing the shifting of numbers of skilled operations from one industry to another, sometimes crippling important war work, is also to be taken in hand.

The operation of traction roads has been greatly hampered by the lack of sufficient platform men. The car crews have been decimated by the glittering wage offers of shipyards and munition plants. In one instance from 125 to 150 motormen and conductors on one railway operating in shipyard territory abandoned their regular work for this employment. The road is still 100 men short of a full operating complement, and it is employing every man of age and upward fit to handle and control an electric car. One important line in the leading Eastern city running on an average of 1000 cars daily, now has only 600 in service, shortage of competent car crews causing the limitation in the service the company is able to render.

Rolling Stock

Gary (Ind.) Street Railway referred to in last week's ELECTRIC RAILWAY JOURNAL as having received six double-end center-entrance cars (two motors and four trailers), supplies the appended specifications:

Number of cars ordered	Six
Name of road	Gary Street Railway
Date order was placed	June 12, 1917
Date of delivery	March and April, 1918
Builder of car body	McGuire-Cummings Mfg. Co.
Type of car	Two motor and four trailer, double-end center-entrance
Seating capacity	56
Weight (total)	Motor, 43,000 lb.; trailer, 30,000 lb.
Length over bumpers	45 ft.
Length over vestibule	44 ft.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft.
Body	All steel
Interior trim	Cherry
Headlining	Agasote
Roof, arch or monitor	Arched
Air brakes	Westinghouse Traction Brake Co.
Bumpers	Rico anti-climbers
Control, type	HLD
Couplers	Tomlinson No. 8
Curtain fixtures	Rex all-metal
Curtain material	Pantasote
Designation signs	Hunter illuminated
Door operating mechanism	National Pneumatic Co.
Fare boxes	Johnson
Fenders or wheelguards	H-B life guards
Gears and pinions	Westinghouse
Hand brakes	Double-acting
Heaters	Gold Car Heater Co., No. 405-E with thermostatic control
Headlights	Crouse-Hinds combination
Motors, type and number	4 WH-514-A
Registers	International
Sanders	O-B Pneumatic
Sash fixtures	Edwards No. 13-O D-1
Seats, style	Hale & Kilburn
Seating material	Rattan
Step treads	Universal anti-slip
Trolley catchers or retrievers	Knutson
Trolley base	Union Standard No. 13-D
Trucks, type	Light weight with 6-ft. wheelbase
Ventilators	Railway Utility Co.
Wheels (type and size)	Griffin 26 in.

Tacoma (Wash.) Municipal Railway, through C. D. Atkins, commissioner of public works, has purchased ten passenger cars from the Minneapolis (Minn.) Street Railway at a cost of $60,000. They were recently received and put in service on the tideflats car line serving the shipyards and industrial districts. Previous mention of the transaction, then in contemplation, was made in the ELECTRIC RAILWAY JOURNAL of May 11.

Public Service Railway, Newark, N. J., which placed an order for thirty-three cars with the Cincinnati Car Company, as noted in the ELECTRIC RAILWAY JOURNAL of May 4, furnishes the following specifications:

Number of cars ordered	33
Name of road	Public Service Ry. Co.
Builder of car body	Cincinnati Car Co.
Type of car	Passenger—prepayment motor car
Seating capacity	46
Weight (total)	Approximately 42,500 lb.
Bolster centers, length	24 ft. 6 in.
Length over bumpers	48 ft. 4½ in.
Length over vestibule	34 ft. 0¾ in.
Width over all	8 ft. 7 in.
Height, rail to trolley base	11 ft. 5¾ in.
Body	Semi-steel
Interior trim	Cherry
Headlining	Agasote
Roof, arch or monitor	Combination
Air brakes	General Electric Co.
Bumpers	Channel iron
Car trimmings	Bronze
Conduits and junction boxes	Westinghouse
Control, type	WH-HL
Couplers	Tomlinson
Curtain fixtures	National Lock Washer Co.
Curtain material	Double Pantasote
Designation signs	Hunter
Door operating mechanism	Public Service Ry. Co.
Fare boxes	Johnson
Fenders or wheelguards	H-B life guard
Hand brakes	Horne Mfg. Co.
Heaters	Gold Car Heating Co.
Headlights	Trolley Supply Co. No. 14
Journal boxes	Symington Torsion lid
Lightning arresters	Westinghouse-MR
Motors	2-WH. 307, C. V. 4, outside hung
Registers	Sterling No. 15
Sanders	Public Service Ry. Co.
Sash fixtures	O. M. Edwards Co.
Seats, style	Longitudinal—H. B. & W.
Seating material	Canvas lined rattan
Step treads	Lead—Public Service Ry. Co.
Trolley catchers	Ideal
Trolley base	U. S. No. 14
Trucks, type	Standard O-45
Ventilators	Garland
Wheels (type and size)	Drivers: 33 in., steel; Pony: 22 in., cast

Trade Notes

Goldschmidt & Forbes, Inc., New York, N. Y., have been appointed agents for New York and New Jersey for the Drew Electric & Manufacturing Company, Indianapolis, manufacturer of electric railway, light, power and gas materials.

Railway Improvement Company, New York, N. Y., has just shipped twenty-one Rico coasting recorders to the Australian General Electric Company for use on the lines of the Melbourne-Brunswick-Coburg Tramways Trust, Melbourne, Australia.

Princeton (Ind.) Utilities Company has been chartered by James C. Johnston, Samuel T. Heston, Jacob L. Knauss and Sampel L. May. The company is capitalized at $40,000 and proposes to supply light, heat and power in the city of Princeton and surrounding country.

American Chamber of Commerce, Paris, France, in its fortnightly information pamphlet, publishes a list of articles which are prohibited for exportation and re-exportation. Among other commodities is given that of compositions of products for electric insulation and tubes and pipes for boilers.

Jeffery-Dewitt Insulator Company, Huntington, W. Va., which has opened its new plant at Kenova, W. Va., will continue operation of the present factory at Detroit and enlarge it to meet the demands for manufacturing spark-plug porcelains and other porcelain material of that nature.

O. S. Lair, department manager for the Western Electric Company in various cities of the United States for the last seventeen years, and for the last four years manager of the Los Angeles (Cal.) office of the company, has resigned. Mr. Lair will become associated with the W. Ross Campbell Company, Los Angeles.

A. Huetter, for a number of years superintendent of the Boonton (N. J.) Rubber Manufacturing Company, is now vice-president and general manager of the Premier Rubber & Insulation Company of Dayton, Ohio. The new plant of the company, completed April 1 and in operation since May 1, is a one-story brick building, 68 ft. x 100 ft., with a separate power house of its own.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has purchased the property, business and good-will of the Krantz Manufacturing Company, Inc., of Brooklyn, N. Y., manufacturer of safety and semi-safety electrical and other devices, switchboards, floor boxes, bushings, etc. The supply department of the Westinghouse Company will act as exclusive sales agent of the products of the Krantz Manufacturing Company, whose business will be continued under its present name. H. C. Hoke of the Westinghouse company, will represent the supply department at the Krantz factory.

New Advertising Literature

General Electric Company, Schenectady, N. Y.: Bulletin 46,019A, describes the construction and specification of its portable instrument Type P-8.

Illinois Electric Porcelain Company, Macomb, Ill.: Catalog on electrical porcelain installations in which it features power insulators for distribution voltage.

Walter A. Zelnicker Supply Company, St. Louis: Bulletin No. 237, or that for May, 1918. It contains seventy-two pages descriptive of used and new material for sale by this concern.

Ohio Brass Company, Mansfield, Ohio: "Guarding the Grade Crossings" is the title of an illustrated catalog describing in detail, accompanied by statistics, the company's national trolley guard, with various illustrations shown in connection with prominent electric railways throughout the country.

Page Steel & Wire Company, New York, N. Y.: Illustrated booklet entitled "Aristos Copperweld Copper Clad Steel Wire." It contains notes on the manufacture of wire in general, on physical and electrical properties of composite (copperweld) wire, gives tests, specifications and suggestions for determining sizes of wire on high-tension and trolley lines, and contains information for calculating line drop, feeders and short transmission lines, sag and tension in spans.

NEW YORK METAL MARKET PRICES

	June 12	June 19
Copper, ingots, cents per lb	23⅛	23⅛
Copper wire base, cents per lb	26⅛	26⅛
Lead, cents per lb	7⅛	7.235
Nickel, cents per lb	40	40
Spelter, cents per lb	7.62	[illegible]
Tin, Chinese,* cents per lb	.92	90
Aluminum, 98 to 99 per cent., cents per lb	†33.00	†33.00

* No Straits offering. † Government price in 50-ton lots or more, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	June 12	June 19
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19⅛	19⅛
Red brass, cents per lb	19	19
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6⅛	6⅛
Zinc, cents per lb	5⅛	5⅛
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	June 12	June 19
Rubber-covered wire base, New York, cents per lb	27 to 30	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	34⅛ to 37.10	35 to 37.10
Weatherproof wire (100 lb. lots), cents per lb., Chicago	35.42 to 38.35	35.42 to 38.35
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 100 to 500-ton lots, per gross ton	$67.50	$67.50
T-rails (A. S. C. E. Standard) 500-ton lots, per gross ton	$62.50	$62.50
T-rails, high (Shanghai), cents per lb	4⅛	4⅛
Rails, girder (grooved), cents per lb	4⅛	4⅛
Wire nails, Pittsburgh, cents per lb	3⅛	3⅛
Railroad spikes, drive, Pittsburgh base, cents per lb	4⅛	4⅛
Railroad spikes, screw, Pittsburgh base, cents per lb	8	[illegible]
Tie plates (flat type), cents per lb	*3⅛	*3⅛
Tie plates (brace type), cents per lb	*3⅛	*3⅛
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3⅛	*3⅛
Angle plates, cents per lb	*3⅛	*3⅛
Angle bars, cents per lb	*3⅛	*3⅛
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	[illegible]	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount†	80%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount	80%	80%
Car window glass (double strength, all sizes AA quality), New York discount	82 & 3%	82 & 3%
Waste, wool (according to grade), cents per lb	11⅛ to 22	11⅛ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13⅛	13 to 13⅛
Asphalt, hot (150 tons minimum), per ton delivered	$38.50	$38.50
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.50	$42.50
Asphalt filler, per ton	$45.00	$45.00
Cement (truck lots), New York, per bbl	$3.20	$3.20
Cement (carload lots), Chicago, per bbl	$3.26	$3.26
Cement (carload lots), Seattle, per bbl	$3.60	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.58	$1.58
White lead (100 lb. keg), New York, cents per lb	10⅛	10
Turpentine (bbl. lots), New York, cents per gal	52⅛	42⅛

* Government price. † These prices are f.o.b. works, with boxing charges extra.



El Paso has proved the Peacock

El Paso has been using scores of Peacock Brakes of vertical wheel type successfully for many years in straightaway, all-day, every-stop service.

These Peacocks will stay on the cars which are being remodeled to the Safety type because having made good as an all-the-time brake there can be no question about its reliability as a contingency brake.

A standby brake cannot be considered merely as an ornament. When it's wanted the need may be desperate.

If your standby on Safety Cars is a Peacock it is a standby in the best sense of that word!

National Brake Co.

Buffalo, N. Y.



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Industrial Plants and Buildings, Steam Power Stations, Water Power Developments, Substations, Gas Plants, Transmission Lines, Electric and Steam Railroad Work.

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784 Continental & Commercial National Bank Bldg.

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H. M. Byllesby & Company, Inc.

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Analytical Studies of financial and operating conditions, appraisals and rate adjustments of electric railway and all public utility properties.

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Appraisals, Rate Investigations, Interurban and Street Railways, Traffic Surveys, Financial Reports

8 EAST LONG ST., COLUMBUS, OHIO

You are a faithful subscriber and reader of the Electric Railway Journal. You know how useful it is to you. Why not give us the names of those of your electric railway friends who would also benefit by being subscribers to the Electric Railway Journal? We will be glad to send specimen copies to any names and addresses that you mention.

ELECTRIC RAILWAY JOURNAL

THE P. EDW. WISCH SERVICE

Suite 1710 Park Row Bldg., New York
DETECTIVES
Suite 715 Board of Trade Bldg., Boston

ELECTRICAL TESTING LABORATORIES
Electrical, Photometrical and Mechanical Testing.
80th Street and East End Ave., New York, N. Y.

Scofield Engineering Co. Consulting Engineers
PHILADELPHIA, PA.
POWER STATIONS GAS WORKS
HYDRAULIC DEVELOPMENTS ELECTRIC RAILWAYS

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.



Talk about cutting melons—

Here's an outfit that is returning electric railways

1,000% Dividends A Year on Their Investment!

The INDIANAPOLIS Portable Electric Welder

Indianapolis Switch & Frog Co.

Manufacturers of only Highest Grade Manganese and Built-up Special Work

Springfield, Ohio

SALES OFFICES New York, Chicago Kansas City, Spokane, Portland, Seattle, Los Angeles, San Francisco

5 Years Ago We Saved A Firm $2300

Many things have happened since this advertisement appeared in the Electric Railway Journal five years ago. Look at that first paragraph —"A California railroad saved $2300 on a single layout with the Indianapolis Portable Electric Welder."

$2300 five years ago. How much would that be today? Close to $10,000.

And we are still in business—in business to save money for you.

Five years of success is enough test to convince the most skeptical person of the merits of the Indianapolis Electric Welder.

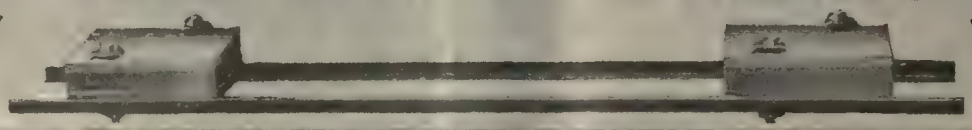
No need to go into details as to what it will do. There are enough "Apex" and "Simplex" joints in the United States to prove their own worth.

The reason is because they have been a success.

Indianapolis Switch and Frog Co.

Springfield, Ohio

The MECHANICAL RAILWAY TIE



BETTER TRACKS
at Less Cost

Can Be Laid
by using
D.M. Ties all
the way!

Permanent—
Resilient—
Economical.



Are the Result
of careful
construction.

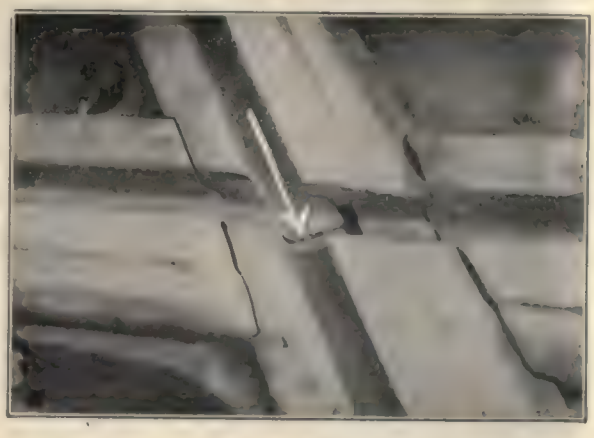
And the best and most careful method known so far is that of using D.M. Ties.

And these Ties have **Made Good** with a vengeance.

Dayton Mechanical Railway Ties are not only a **theoretical** solution of track troubles. They are the **practical** outcome of years of work and tests on track carrying both city and heavy, high-speed, interurban cars.

Write for full particulars.

THE DAYTON MECHANICAL TIE CO.
201 Third Street Arcade
DAYTON, OHIO



Main filling or backbone of rolled rail crossing broken at flangeway intersection

Rolled Rail Crossings

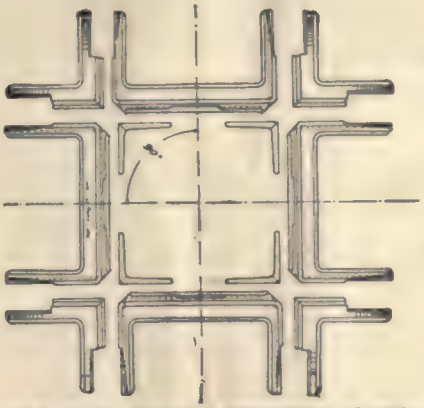
develop frequent fractures at the point shown in the picture to the left. Such breaks are unavoidable because of the lack of flexibility at the flangeway intersections.

Experience has demonstrated that rolled rail wears out in less than one-quarter the time of cast manganese.

As a result these crossings have to be replaced frequently so that their apparent lower first cost, when compared with that of articulated cast manganese crossings, is deceptive.

Balkwill Articulated Cast Manganese Crossings

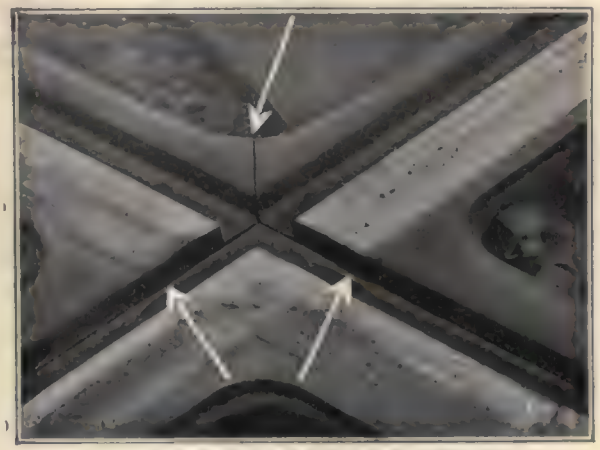
have scientifically designed joints at the places where breakage formerly occurred. It takes several rolled rail crossings to equal the life of but *one* Balkwill Articulated Cast Manganese Crossing. Therefore the Balkwill Crossing is the cheapest in the long run.



Joints at the flangeway intersections of Balkwill Articulated Cast Manganese Crossings positively eliminate breakage

It saves interruption to traffic, makes less demand on labor, which is now so scarce, and also reduces the cost of making replacements frequently.

In other words, it gives you



Joints in Balkwill Articulated Cast Manganese Crossings are life savers. They positively prevent breakage at flangeway intersections, permitting 100% wear before renewal is necessary

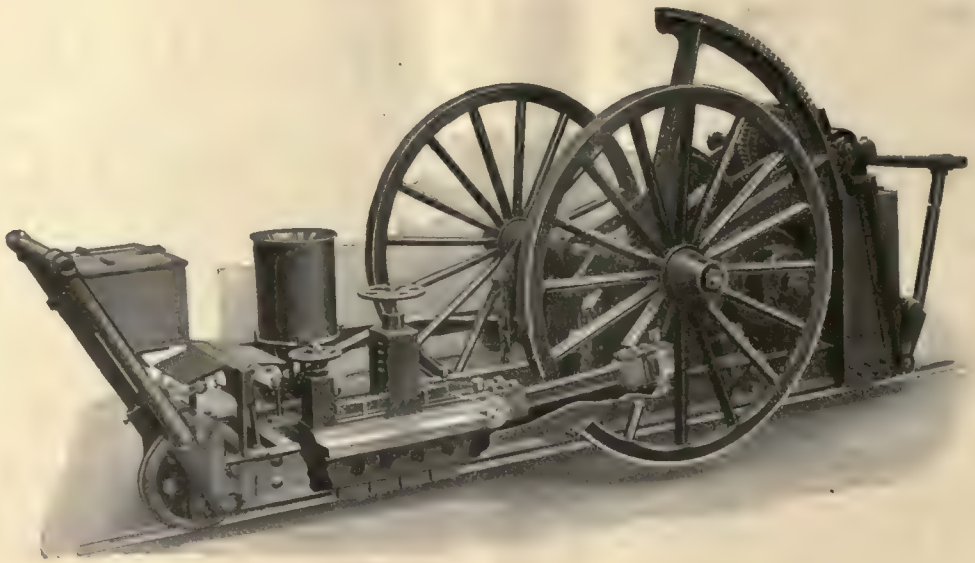
MORE WEAR PER DOLLAR THAN ANY OTHER CROSSING YOU CAN BUY

Order Balkwill Articulated Cast Manganese Crossings Direct from Your Special Work Manufacturers

Write us for detail information and list of installations. Don't accept a substitute as there is none.

The Balkwill Manganese Crossing Co.

506 Williamson Building, Cleveland, Ohio



The Dollars and Cents Value of Even a Short Increase of Track Life

No one would be foolish enough to contend for a moment that the consistent and universal use of

RECIPROCATING TRACK GRINDERS

would forever eliminate the necessity of replacing track.

Track deteriorates from many causes and like everything else will not last forever, no matter how well maintained.

It has, however, been fully and completely demonstrated that the careful maintenance of track and the use of Reciprocating Grinders will tremendously prolong the useful life of track even when conditions are so bad as to make replacement apparently necessary. Many companies have added years of life to apparently hopeless track by grinding out the bad spots with a Reciprocating Grinder.

Even where such prolongation of usefulness is for a relatively short period the money saving is very great.

For example, if the expenditure of the 15 million dollars or more spent by electric railways in 1917 for replacing track had been delayed by only one year it would have saved the industry at least the interest charge on that amount for one year. And this interest charge at 5% for one year would have been

Seven Hundred and Fifty Thousand Dollars

The use of Reciprocating Grinders, especially if used when corrugations or cupped joints first appear, prolongs the life of track for *many* years.

RAILWAY TRACK-WORK COMPANY

30th and Walnut Streets, Philadelphia

AGENTS: Holden & White, Inc., 343 S. Dearborn St., Chicago.

Safe!

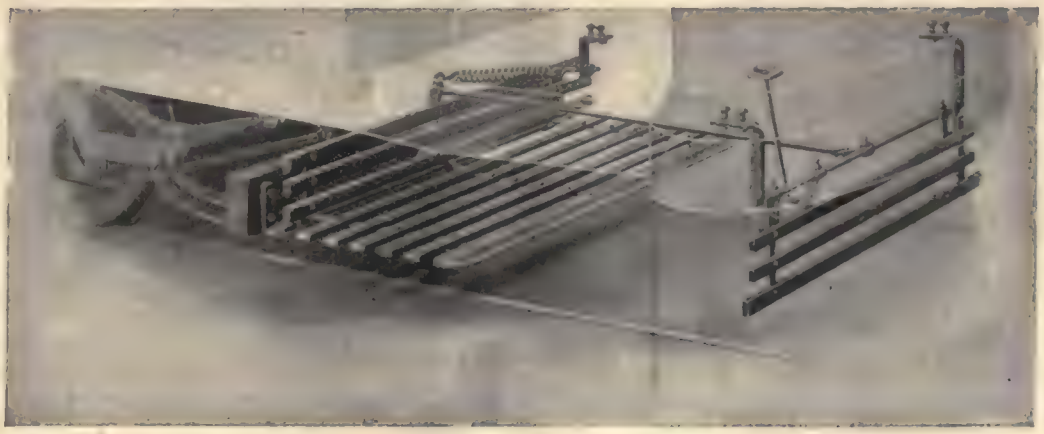


There are more street cars running today in the United States than ever before.

There have been fewer accidents in 1917, in which pedestrians were run over by trolley cars, than in the years previous. Why?

Because the H-B Life Guard stands between the death-dealing wheels of the heavy car and the body of the fallen pedestrian.

It works instantly, automatically and reliably



Ask us for the mechanical details.

The Consolidated Car Fender Co.
Providence, R. I.

General Sales Agent
Wendell & MacDuffie Co.
61 Broadway, New York



Columbia Brake Lever



No. 2

The Forging

ON being removed from the furnace, a pair of our husky lads bring the glowing bar to a 5-ton steam hammer, where it is forged most thoroughly for the responsible work it will have to do.

Step No. 3 will show the squaring off of the ends.



Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St.

Brooklyn, N. Y.

And, in the meantime, remember that we are also making:

TOOLS

Armature and Axle Straighteners
Armature shaft straighteners
Armature buggies and stands
Babbitting molds
Banding and heading machines
Car hoists
Car replacers
Coil taping machines for armature leads
Coil winding machines
Pinion pullers
Pit jacks
Signal or target switches
Tension stands

W. R. Kerschner Co., Inc., N. Y.
Holden & White, Inc., Chicago
F. F. Bodler, San Francisco
Railway & Power Eng. Co., Ltd., Toronto, Ont.



And, in the meantime, remember that we are also making:

CAR EQUIPMENT

Armature and Axle Bearings
Armature and field coils
Bearings (Axle and Armature)
Brush-holders and Brush-holder springs
Brake, door and other handles
Brake forgings, riggings, etc.
Car trimmings
Commutators
Controller handles
Forgings of all kinds
Gear cases (steel or malleable iron)
Grid resistors
Third-rail shoe beams and accessories
Trolley poles (steel) and wheels

Another User of

The MILLER Trolley Shoe

for City and Interurban Service



Scores of Miller Trolley Shoes are now in use on this street railway in New England.

Miller Trolley Shoes have replaced 4.5-inch wheels on city lines.

Miller Trolley Shoes have replaced 6-inch wheels on the interurban lines—

Such as the 22-mile line on which the speeds run up to 40 m.p.h.

A report of our observer includes this significant comment:

"The Car Crews are enthusiastic about MILLER TROLLEY SHOES"

No wonder: the Miller Trolley Shoe hugs the wire under all conditions of speed, wind, and weather.

Miller Trolley Shoe Co., West Newton, Mass.

SPECIAL REPRESENTATIVE: Holden & White, Inc., Chicago

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S. I. Wallen, Los Angeles, Cal.

F. F. Bodler, San Francisco, Cal.

W. F. McKenney, Portland, Oregon.

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This is the

Griffin F. C. S. Wheel

The surface of tread and flange contains three and one-half per cent carbon white iron, harder than tool steel, insuring long wear.

The softer hub permits easy machining.

It is a wheel where the metal is so distributed that each part is particularly adapted to the requirements demanded of it.

The arched face plate gives additional strength.

Over 200,000 F. C. S. wheels are in use under city and interurban electric railway cars throughout the country.

The low friction between rail and flange keeps the flange wear and danger of derailment down to a minimum.

GRIFFIN WHEEL COMPANY

McCormick Building, Chicago, Ill.

FOUNDRIES

Chicago Detroit Boston Denver St. Paul
Los Angeles Tacoma Kansas City

Steel for Service

Heavy loads on electric railway service have called for a forged axle of maximum strength and durability.

Carnegie Steel Company makes electric railway axles standard forged, annealed or quenched-and-tempered. Its experience with the heat-treatment of steel in its special heat-treating plant has been extensive, not only in connection with the manufacture of axles, but of other steel products also.

Its heat-treating equipment is modern and scientific in every detail and all work is personally supervised by experienced metallurgists. The best of facilities for accurate testing are provided and every precaution is taken to insure actual meeting of requirements of specification in finished products.

The best quality of steel in connection with the most approved practice in treatment insures uniformity and superiority of

Carnegie Electric Railway Axles

The mark of quality  It protects the user

Carnegie Steel Company

General Offices: Pittsburgh, Pa.

1074

NOARK
APPROVED FUSES

Reliable!

IN these days, when every man and machine must do the utmost, you want to use a fuse you can trust. Damaged machinery is not easily replaced and repairs may hold up work essential to the nation. Besides, labor is too scarce and high to waste in forced idleness or repairs which could have been avoided.

A "Noark" fuse is a sentinel on guard in an electric circuit, ready at all times to protect man, machinery and plant from danger. It can be trusted—not to blow when it shouldn't, but to blow the instant it should.

This reliability of "Noark" fuses, is an established fact based on past performance in thousands of instances.

Why should a manufacturer or power plant take any chances at all?

"Noark" fuses can be had in all amperages and voltages. Specify "Noark" when you order from your dealer or jobber.

H. W. JOHNS-MANVILLE CO.
NEW YORK CITY
10 Factories—Branches in 61 Large Cities



"Noark" electrical products are manufactured by the Johns-Pratt Co., Hartford, Conn., U. S. A. H. W. Johns-Manville Co., Sole Selling Agents

IS 5 CENTS
sufficient?

—for a long haul in ordinary service? Have you considered raising your fare from 5 to 6 cents? Would it be good policy?

The recent investigation of the 5c fare contained in a report compiled for the Massachusetts Institute of Technology by Prof. D. C. Jackson and D. J. McGrath covers the question fully.

Send today for a free 10-day examination of this interesting report. Merely fill in and mail the coupon below.

STREET RAILWAY FARES

169 pages, 6 x 9, fully illustrated, price, $2.50 net, postpaid.

***by* Dugald C. Jackson and David J. McGrath**

Just Issued

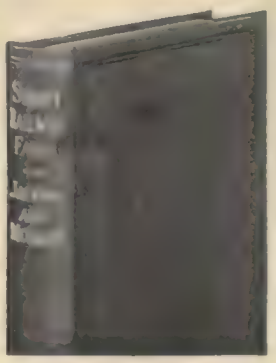
The data of street railway traffic and fares have been broadly investigated. The factors of street railway traffic which influence the cost of carriage and how these factors affect the practicability of making long hauls for 5c. in ordinary service, are given in full.

This report is fully illustrated with tables and charts which clearly show the limitations and possibilities existing in the field of electric street railway transportation at the present time.

The research was not limited to the United States alone, but also includes conditions in foreign countries.

The text has been prepared especially for street railway officials, municipal officers and publicists, and we believe these facts contain much of practical value to every street railway man.

Let us send you this new book for free examination. You are under no obligation whatever. Keep it ten days and return if it is not what you want.



Send no money— Just the coupon

Our new 1918 general catalogue contains many standard works on the subject of electric railways. Send for it today and let us add your name to our mailing list for all new books on this subject as they are issued.

FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc.,
239 West 39th St., New York, N. Y.

You may send me on 10 days' approval Jackson and McGrath — Street Railway Fares — $2.50 net, postpaid.

I agree to pay for the book or return it postpaid within 10 days of receipt.

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O. H. Steel and Malleable Iron Castings
Solid Forged Gear Blanks
Steel Forgings — Iron Forgings
Forged and Rolled Steel
Pipe Flanges
Ring Dies — Rings — Roll Shells
Steel Springs

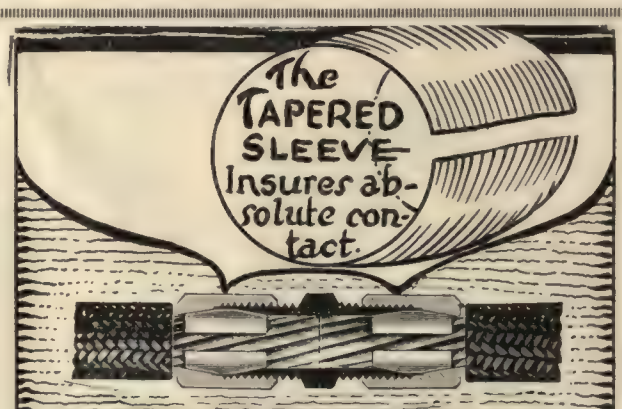
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PITTSBURGH
MEXICO CITY
LONDON, ENGLAND
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BUSINESS isn't all selling—are you doing YOUR share of the buying?



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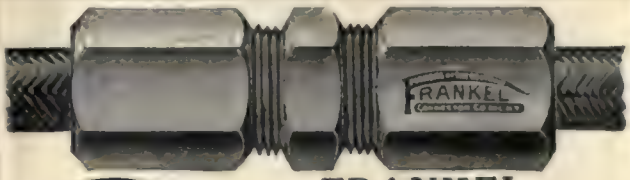
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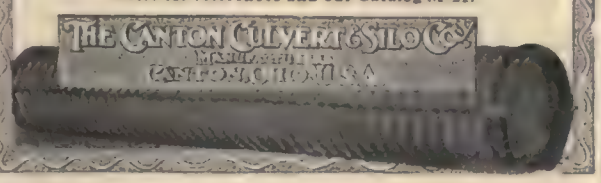
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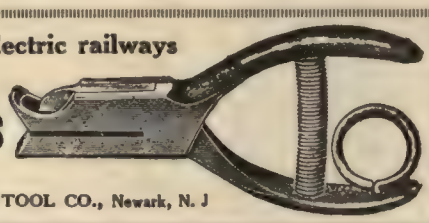
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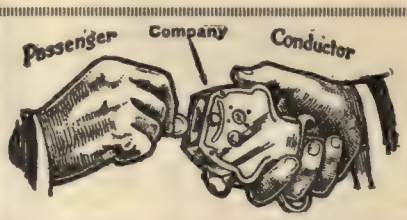
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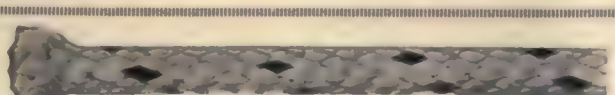
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GENERAL auditor or secretary-treasurer; 15 years' experience railroad and street railway accounting. Thoroughly conversant with Interstate Electric Railway Accounting Married; age 40. Send for record and references. PW-172, Elec. Ry. Journal, Chicago.

MASTER mechanic wants position; experienced on city and interurban cars; familiar with G. E. and Westinghouse multiple control. Can maintain equipment at high standard. PW-169, Elec Ry. Journal, Cleveland.

SUPERINTENDENT of Rolling Stock and Master Mechanic now employed in charge of 350 city and interurban cars, for satisfactory reasons seeks opportunity to make a change. Married. Thoroughly experienced and can maintain equipment at high standard. PW-189, Elec. Ry. Journal.

TRANSPORTATION—Can handle your transportation department and get results; 14 years with large street railway; thoroughly familiar with every detail of street railway transportation; best of reference from present employer; age 38. PW-181, Elec. Ry. Journal, Philadelphia.

AGENTS AND SALESMEN

Salesman Wanted

Young man with engineering training, to sell steam and street railway track work. State salary expected and all details in first letter. AS-188, Elec. Ry. Journal, Chicago.

60 Tons

7-in Girder Rails

P. S. Co. Section No. 238

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Commercial Trust Bldg., Philadelphia, Pa.

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300 tons 70- and 75-lb. Relayers and Construction; all or part; located near Albany, New York.

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16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.
We positively own these Rails and offer same in carload lots and over.
25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.
Immediate shipment guaranteed and prices very attractive.
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Rails cut to length for structural purposes.
Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Building, Pittsburgh, Pa.

Rockland, Thomaston & Camden St. Ry. Rockland, Maine. List of Material to be Sold at Power House, Rockport, Maine

BOILERS

125 hp. return tubular fire tube Boiler. A. D. Ward, Augusta, Maine. Age 25 years.
125 hp. return tubular fire tube boiler. Charles River Iron Works, Edward Kendall Sons, Cambridgeport, Mass. Age 25 years.
125 hp. return tubular fire tube boiler. A. D. Ward, Augusta, Maine. Age 25 years.
125 hp., 72 in. x 19 ft. 6 in. return tubular fire tube Boiler. Hodge Boiler Works, East Boston, Mass. Age 10 years.

CONDENSING ENGINE

1—500 hp. tandem, compound, Hamilton Corliss, with left-handed belt wheel. Built by Hooven, Owens & Reutschler, Hamilton, Ohio. Size of engine, 22 in. x 42 in. x 48 in., 70 r.p.m. Size of belt wheel, 24 in. x 48 in., with jet condenser direct connected to the main crank and feed water heater connected in the low pressure exhaust line. This unit is all complete, and in running order, belted to a line shaft with 133 ft. of 48 in. 2-ply leather belt.

SHAFTING AND PULLEYS

60 ft. of 6 in. and 6½ in.

ALTERNATOR

1—312 Kw., General Electric, 60-cycle, 2300-volt, type A.T.B., 12—312—600, form B, 78 amps. Driving pulley, 20 in. diameter by 32 in. wide, with 49 ft. of 2-ply 31 in. leather belting.

CORLISS ENGINE

1—600 hp. cross compound condensing. Built by Robert Wetherell Co., Chester, Pa. Direct connected to a 400-Kw. D.C., 550-volt, Crocker-Wheeler Ey. Generator. Size of engine, 18 in. x 36 in. x 42 in., 100 r.p.m., with a Blake steam driven jet condenser, and a feed water heater in the exhaust line. All in running condition.

OIL FILTER

1—No. 23 White Star. Filtering capacity per day, 350 gallons.

FEED PUMPS

1—7½ in. x 4½ in. x 10 in.
1—7 in. x 5 in. x 10 in.

HEATER

1—125 hp. Cochrane Feed Water, Open.

STEAM PIPE

And fittings connecting engines to boilers.

WATER TANK

1—10,000 gallon Cypress.

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in This Issue

Acetylene Service and Apparatus.
Oxweld Acetylene Co.

Advertising, Street Car.
Collier, Inc., Barron G.

Air Rectifiers.
Holden & White, Inc.

Anti-Climbers
Railway Improvement Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Armature Shafts.
Laclede Steel Co.

Automobiles and Buses.
Brill Co., The J. G.

Axles.
Laclede Steel Co.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles, Car Wheel.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
National Railway Appliance Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
Electric Service Supplies Co.
International Register Co., The

Batteries, Dry.
Johns-Manville Co., H. W.
Nichols-Lintern Co.

Batteries, Storage.
Electric Storage Battery Co.

Bearings and Bearing Metals.
Ajax Metal Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Kerschner Co., Inc., W. R.
More-Jones Brass & Metal Co.
St. Louis Car Co.
Westinghouse Elec. & M. Co.

Bearings, Center and Roller Side.
Holden & White, Inc.

Bearings, Roller and Ball.
Gurney Ball-Bearing Co.
S K F Ball Bearing Co.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail.
Niles-Bement-Pond Co.
Zelnicker Sup. Co., W. A.

Boilers.
Babcock & Wilcox Co.

Boiler Cleaning Compounds.
Johns-Manville Co., H. W.

Boiler Coverings.
Johns-Manville Co., H. W.

Boiler Tubes.
National Tube Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
Imperial Brass Mfg. Co.
Ohio Brass Co.
Oxweld Acetylene Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Lincoln Bonding Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Book Publishers
McGraw-Hill Book Co., Inc.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Etc.)
Hubbard & Co.
Lindsley Bros. Co.
Ohio Brass Co.

Brake Adjusters.
Holden & White, Inc.
Westinghouse Traction Brake Co.

Brake Shoes.
Amer. Brake Shoe & Fdry. Co.
Barbour-Stockwell Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
St. Louis Car Co.

Brakes, Brake Systems and Brake Parts.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
National Brake Co.
St. Louis Car Co.
Westinghouse Trac. B. Co.

Brooms, Track, Steel or Rattan.
Paxson Co., J. W.
Zelnicker Supply Co., W. A.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.

Brushes, Carbon.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
United States Graphite Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
United States Graphite Co.

Buckets, Grab.
Beaument Co., R. H.

Bunkers, Coal.
Beaument Co., R. H.

Bushings, Case Hardened & Manganese
Bemis Car Truck Co.

Cables. (See Wires and Cables.)

Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc.—See those headings.)

Car Trimmings. (For Curtains, Registers, Doors, Seats, etc.—See those headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Kuhlman Car Co., G. C.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.
Wason Mfg. Co.

Cars, Section.
Mudge & Co.

Cars, Second Hand.
Electric Equipment Co.

Cars, Self-Propelled.
Electric Storage Battery Co.
General Electric Co.

Castings, Brass, Composition or Copper.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
More-Jones Brass & Metal Co.

Castings, Gray Iron and Steel.
American Steel Foundries
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
St. Louis Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
Amer. Brake Shoe & Fdry. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Electric Service Supplies Co.
Holden & White, Inc.
Kerschner Co., Inc., W. R.
Ohio Brass Co.
Wood Co., Chas. N.

Ceiling, Car.—(See Head Lining.)

Circuit Breakers.
Automatic Reclosing Circuit Breaker Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Clamps and Connectors for Wires and Cables.
Anderson Mfg. Co., A. & J. M.
Dossert & Co.
Electric Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

Cleaners and Scrapers Track.—(See also Snow-Plows, Sweepers and Brooms.)
Brill Co., The J. G.
Ohio Brass Co.

Clusters and Sockets.
General Electric Co.

Coal and Ash Handling.—(See Conveying and Hoisting Machinery.)

Coasting Recorders.
Railway Improvement Co.

Coil Banding and Winding Machines.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Coils, Armature and Field.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Coils, Choke and Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
International Register Co., The

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.
Wood Co., Chas. N.

Commutator Truing Devices.
General Electric Co.

Commutators or Parts.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Compressors, Air.
General Electric Co.
Westinghouse Trac. B. Co.

Concrete Mixers.
Jaeger Machine Co.

Condensers
General Electric Co.
Westinghouse Elec. & M. Co.

Conduits, Underground.
Johns-Manville Co., H. W.

Connectors, Solderless.
Dossert & Co.
Westinghouse Elec. & Mfg. Co.

Controller Regulators.
Electric Service Supplies Co.

Controllers or Parts.
Columbia M. W. & M. I. Co.
General Electric Co.
Johns-Manville Co., H. W.
Kerschner Co., Inc., W. R.
Westinghouse Elec. & Mfg. Co.

Controlling Systems.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Converters, Rotary.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Conveying and Hoisting Machinery.
Columbia M. W. & M. I. Co.
Green Engrg. Co.

Cord, Bell, Trolley, Register, etc.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The
Samson Cordage Works

Cord Connectors and Couplers.
Electric Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car.
Brill Co., The J. G.
Ohio Brass Co.
Van Dorn Coupler Co.
Westinghouse Trac. B. Co.

Cranes. (See also Hoists.)
Niles-Bement-Pond Co.

Creosoting. (See Wood Preservatives.)

Cross Arms. (See Brackets.)

Crossing Foundations.
Balkwill Manganese Crossing Co
International Steel Tie Co.

Crossing Signals. (See Signals, Crossing.)

Crossings, Track. (See Track, Special Work.)

Culverts
American Rolling Mill Co.
Bark River B. & Culvert Co.
California Cor. Culvert Co.
Canada Ingot Iron Co., Ltd.
Canton Culvert & Silo Co.
Coast Culvert & Flume Co.
Corrugated Culvert Co.
Delaware Metal Culvert Co.
Dixie Culvert & Metal Co.
Hardesty Mfg. Co., R.
Illinois Corrugated Metal Co.
Independence Cor. Cul. Co.
Iowa Pure Iron Culvert Co.
Kentucky Culvert Mfg. Co.
Lone Star Culvert Co.
Lyle Corrugated Culvert Co.
Michigan Bridge & Pipe Co.
Montana Culvert Co.
Nebraska Culvert & Mfg. Co.
Nevada Metal Mfg. Co.
New England Metal Cul. Co.
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Don't let LABOR SHORTAGE hold them up in your coil department. You can't get more men—but you can save time and money by sending the coils to us for re-insulation with

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We will return them promptly—better insulated and more durable than when new.
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A.C. or D.C. Switchboard or Portable Instruments for every field of Indicating Electrical Measurement. In writing for catalogs and bulletins, please specify the field that interests you.

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Pennsylvania Metal Cul. Co.
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Sioux Falls Metal Cul. Co.
Spokane Cul. & Tank Co.
Tennessee Metal Culvert Co.
United States Bridge & Pipe Co.
Utah Corr. Cul. & Flume Co.
Virginia Metal & Culvert Co.
Western Metal & Mfg. Co.
Wyatt Metal & Boiler Works.

Curtains and Curtain Fixtures.
Brill Co., The J. G.
Electric Service Supplies Co.
St. Louis Car Co.

Cutting Apparatus, Oxy-Acetylene.
Imperial Brass Mfg. Co.
Milburn Co., The Alex.
Oxweld Acetylene Co.

Derailing Devices. (See also Track Work.)
Cleveland Frog & Crossing Co.
Reading Specialties Co.

Destination Signs.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Detective Service.
Wisch Service, P. Edward

Doors, Asbestos.
Johns-Manville Co., H. W.

Door Operating Devices.
Consolidated Car Heating Co.
National Pneumatic Co.

Doors and Door Fixtures.
Brill Co., The J. G.
General Electric Co.
Hale & Kilburn Co.

Doors, Folding Vestibule.
National Pneumatic Co.

Draft Rigging. (See Couplers.)

Drills, Track.
American Steel & Wire Co.
Electric Service Supplies Co.
Niles-Bement-Pond Co.
Ohio Brass Co.

Dryers, Sand.
Electric Service Supplies Co.
Zelnicker Sup. Co., W. A.

Electrical Wires and Cables
Roebling's Sons Co., J. A.

Engineers, Consulting, Contracting and Operating.
Archbold-Brady Co.
Arnold Co., The.
Beeler, John A.
Bylleeby & Co., Inc., H. M.
Ford, Bacon & Davis.
Pugh, S. D.
Richey, Albert S.
Rumery Co., R. R.
Sanderson & Porter.
Scofield Engineering Co.
Sloan, Huddle, Feustel & Freeman
Stone & Webster.
White Companies, The J. G.
Woodmansee & Davidson Engineering Co.

Engines, Gas and Oil.
Westinghouse Elec. & Mfg. Co.

Engines, Steam.
Westinghouse Elec. & Mfg. Co.

Fare Boxes.
Brill Co., The J. G.
International Register Co., The.
National Railway Appliance Co.

Fences, Woven Wire and Fence Posts.
American Steel & Wire Co.
Page Steel & Wire Co.
Standard Steel Mould Co.

Fenders and Wheel Guards.
Brill Co., The J. G.
Consolidated Car Fender Co.
Electric Service Supplies Co.
Star Brass Works.

Fibre and Fibre Tubing.
Johns-Manville Co., H. W.
Westinghouse Elec. & Mfg. Co.

Field Coils (See Coils.)

Filters, Water.
Scaife & Sons Co., Wm. B.

WHAT AND WHERE TO BUY

Fire Extinguishing Apparatus.
Johns-Manville Co., H. W.

Fire-Proofing Material.
Johns-Manville Co., H. W.

Floodlights.
Electric Service Supplies Co.

Flooring Composition.
American Mason Safety Tread Co.
Johns-Manville Co., H. W.

Forgings.
Eureka Co.
Laclede Steel Co.
Standard Steel Works Co.

Frogs, Track. (See Track Work.)

Furnaces. (See Stokers.)

Fuses and Fuse Boxes.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Johns-Manville Co., H. W.
Westinghouse Elec. & Mfg. Co.

Fuses, Refillable.
Columbia M. W. & M. I. Co.
General Electric Co.

Gaskets.
Johns-Manville Co., H. W.
Power Specialty Co.
Westinghouse Traction Brake Co.

Gas Producers.
Westinghouse Elec. & Mfg. Co.

Gates, Car.
Brill Co., The J. G.

Gages, Oil and Water.
Ohio Brass Co.

Gear Blanks.
Carnegie Steel Co.
Standard Steel Works Co.

Gear Cases.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Kerschner Co., Inc., W. R.
Westinghouse Elec. & Mfg. Co.

Gears and Pinions.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Kerschner Co., Inc., W. R.
National Railway Appliance Co.
Nuttall Co., R. D.

Generating Sets, Gas-Electric.
General Electric Co.

Generators.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Gongs. (See Bells and Gongs.)

Graphite.
Morgan Crucible Co.

Greases. (See Lubricants.)

Grinders and Grinding Supplies.
Indianapolis Switch & Frog Co.
Metal & Thermit Corp.
Railway Track-work Co.

Grinding Blocks and Wheels
Railway Track-work Co.

Guards, Trolley.
Electric Service Supplies Co.
Ohio Brass Co.

Harps, Trolley.
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
Hensley Trolley & Mfg. Co.
More-Jones B. & M. Co.
Nuttall Co., R. D.
Star Brass Works.

Headlights.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
St. Louis Car Co.

Heaters, Car (Electric.)
Consolidated Car Heating Co.
Gold Car Heating & Lighting Co.
Smith Heater Co., Peter.

Heaters, Car, Hot Air and Water.
Cooper Heater Co.
Smith Heater Co., Peter.

Heaters, Car (Stove.)
Electric Service Supplies Co.
Smith Heater Co., Peter.

Hoists and Lifts.
Columbia M. W. & M. I. Co.
Duff Mfg. Co.
Ford Chain Block & Mfg. Co.
Niles-Bement-Pond Co.

Hose, Bridges.
Ohio Brass Co.

Hose, Pneumatic and Fire.
Johns-Manville Co., H. W.
Westinghouse Traction Brake Co.

Hydraulic Machinery.
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Electrical Testing Lab's.

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General Electric Co.
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Westinghouse Elec. & M. Co.
Weston Elec'l Instrument Co.

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General Electric Co.
Johns-Manville Co., H. W.
Mitchell-Rand Mfg. Co.
Standard Woven Fabric Co.
Westinghouse Elec. & M. Co.

Insulation. (See also Paints.)
Anderson M. Co., A. & J. M.
Drew Electric & Mfg. Co.
Electric Service Supplies Co.
General Electric Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Mitchell-Rand Mfg. Co.
Westinghouse Elec. & M. Co.

Insulators. (See also Line Material.)
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Insulator Pins.
Electric Service Supplies Co.
Hubbard & Co.

Insurance, Fire.
Marsh & McLennan.

Jacks. (See also Cranes, Hoists and Lifts.)
Brill Co., The J. G.
Buckeye Jack Mfg. Co.
Columbia M. W. & M. I. Co.
Duff Manufacturing Co.
National Ry. Appliance Co.
Templeton, Kenly Co., Ltd.

Joints, Rail.
Carnegie Steel Co.
Rail Joint Co., The
Zelnicker Sup. Co., W. A.

Journal Boxes.
Bemis Car Truck Co.
Brill Co., The J. G.
S K F Ball Bearing Co.

Junction Boxes.
Johns-Manville Co., H. W.

Laboratory.
Electrical Testing Lab's.

Lamp Guards and Fixtures.
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Lamps, Arc and Incandescent. (See also Headlights.)
Anderson M. Co., A. & J. M.
General Electric Co.
Westinghouse Elec. & M. Co.

Lamps, Signal and Marker.
Nichols-Lintern Co.
Ohio Brass Co.

Lathes, Car Wheel.
Niles-Bement-Pond Co.

Lighting Regulators, Car.
Holden & White, Inc.

Lightning Protection.
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Lights, Portable Carbide.
Milburn Co., The Alex.

Line Material. (See also Brackets, Insulators, Wires, etc.)
Anderson M. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Dossert & Co.
Drew Electric & Mfg. Co.
Electric Service Supplies Co.
Eureka Co.
General Electric Co.
Holden & White, Inc.
Hubbard & Co.
Johns-Manville Co., H. W.
More-Jones B. & M. Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Locomotives, Electric.
Brill Co., The J. G.
General Electric Co.
McGuire-Cummings Mfg. Co.
Westinghouse Elec. & M. Co.

Lubricating Engineers.
Galena-Signal Oil Co.

Lubricants, Oil and Grease.
Galena-Signal Oil Co.

Lumber. (See Poles, Ties, etc.)

Machine Tools.
Columbia M. W. & M. I. Co.
Niles-Bement-Pond Co.

Machine Work.
Columbia M. W. & M. I. Co.
Holden & White, Inc.

Mats.
Johns-Manville Co., H. W.

Meters, Car, Watt-Hour.
Economy Electric Devices Co.

Meters. (See Instruments.)
Electric Service Supplies Co.
Wood Co., Chas N.

Mirrors for Motormen.
Drew Elec. & Mfg. Co.

Motors, Electric.
Westinghouse Elec. & M. Co.

Motor Generation, Bonding and Welding.
Lincoln Bonding Co.

Motor Leads
Dossert & Co.

Nuts and Bolts.
Barbour-Stockwell Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Hubbard & Co.

Oils. (See Lubricants.)

Oxy-Acetylene. (See Cutting Apparatus, Oxy-Acetylene.)

Packing.
Johns-Manville Co., H. W.
Power Specialty Co.
Westinghouse Traction Brake Co.

Packing Rings.
Johns-Manville Co., H. W.

Paints and Varnishes. (Insulating.)
Mitchell-Rand Mfg. Co.

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52-"T

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Johns-Manville Co., H. W.

Paints and Varnishes for Woodwork.
National Ry. Appliance Co.

Paving Brick, Filler and Stretcher.
Nelsonville Brick Co.

Paving Material.
Am. Brake Shoe & Fdy. Co.
Barrett Co., The
Nelsonville Brick Co.

Paving Pitch.
Barrett Co., The

Pickups, Trolley Wire.
Electric Service Supplies Co.
Ohio Brass Co.

Pinion Pullers.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
Wood Co., Chas. N.

Pinions. (See Gears.)

Pins, Case Hardened, Wood and Iron.
Bemis Car Truck Co.
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Ohio Brass Co.
Westinghouse Traction Brake Co.

Pipe.
National Tube Co.

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Power Specialty Co.
Standard Steel Works Co.
Westinghouse Traction Brake Co.

Planers. (See Machine Tools.)

Pliers, Insulated
Electric Service Supplies Co.
National Railway Appliance Co.

Pole Reinforcing.
Hubbard & Co.

Pole Sleeves.
Drew Electric & Mfg. Co.

Poles and Ties, Treated.
Lindsley Bros. Co.
Page & Hill Co.
Valentine-Clark Co.

Poles, Metal Street.
Hubbard & Co.

Pole Sleeves.
Drew Elec. & Mfg. Co.

Poles, Ties, Posts, Piling and Lumber.
Carney & Co., B. J.
Lindsley Bros. Co.
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Valentine-Clark Co.
Western Red Cedar Assn.
White Marble Lime Co.

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Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
National Tube Co.
Nuttall Co., R. D.

Poles, Tubular Steel.
National Tube Co.

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Arthur Power-Saving Recorder Co.
Railway Improvement Co.

Pressure Regulators.
General Electric Co.
Ohio Brass Co.
Westinghouse Electric & Mfg. Co.

Punches, Ticket.
Bonney-Vehslage Tool Co.
International Register Co., The
Wood Co., Chas. N.

Purifiers, Feed Water
Scaife & Sons Co., Wm. B.

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Rail Welding. (See Brazing and Welding Processes.)

Rails, Relaying.
Zelnicker Supply Co., W. A.

Rattan.
Brill Co., The J. G.
Electric Service Supplies Co.
Hale & Kilburn Co.
McGuire-Cummings Mfg. Co.
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Arthur Power-Saving Recorder Co

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Rooke Automatic Register Co.

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American Steel & Wire Co.

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Roofing, Building.
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Johns-Manville Co., H. W.

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Johns-Manville Co., H. W.

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Ohio Brass Co.
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Brill Co., The J. G.

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Hale & Kilburn Co.

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Consolidated Car Heating Co.
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Babcock & Wilcox Co.
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Switches, Lock.
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Indianapolis Switch & Frog Co.
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Switches, Track. (See Track, Special Work.)

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Testing Instruments. (See Instruments, Electrical Measuring, Testing, etc.)

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Kilby Frog & Switch Co.
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Transfer Tables.
Archbold-Brady Co.

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General Electric Co.
Westinghouse Elec. & M. Co.

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American Mason S. T. Co.
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Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
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National Railway Appliance Co.
Nuttall Co., R. D.
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Holden & White, Inc.
Miller Trolley Shoe Co.

Trolley Wheels. (See Wheels, Trolley.)

Trolley Wire
Roebling Son's Co., John A.

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St. Louis, Mo.

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One standard driver shoe
One standard car shoe
And there you are—

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FROM one end of industry to the other—from the makers of munitions and war supplies of the most ponderous or delicate character (including aeroplanes), to the owner of a big or little scrap heap—you will find that the word of highest praise is reserved for Oxweld.

The evidence is overwhelmingly in favor of the injector type of blowpipe and the low pressure generator.

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National Tube Co.

Turbines, Steam.
General Electric Co.
Westinghouse Elec. & M. Co.

Turnstiles.
Perey Mfg. Co., Inc.

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Ohio Brass Co.
Westinghouse Traction Brake Co.

Varnishes. (See Paints, etc.)

Ventilators, Car.
Brill Co., The J. G.
Holden & White, Inc.
National Railway Appliance Co.
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St. Louis Car Co.

Voltmeters. (See Instruments.)

Water Softening and Purifying Systems.
Scaife & Sons Co., Wm. B.

Welders, Portable Electric.
Electric Ry. Improvement Co.
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Welding Processes and Apparatus.
Electric Ry. Improvement Co.
General Electric Co.
Imperial Brass Mfg. Co.
Metal & Thermit Corp.
National Ry. Appliance Co.
Oxweld Acetylene Co.
Westinghouse Elec. & M. Co.

Wheel Guards. (See Fenders & Wheel Guards.

Wheel Presses. (See Machine Tools.)

Wheels, Car, Cast Iron.
Bemis Car Truck Co.
Griffin Wheel Co.

Wheels, Car, Steel and Steel Tired.
American Steel Foundries.
Bemis Car Truck Co.
Carnegie Steel Co.
Standard Steel Works Co.

Wheels, Trolley.
Anderson Mfg. Co., A. & J. M.
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Electric Service Supplies Co.
Eureka Co.
General Electric Co.
Hensley Trolley & Mfg. Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
More-Jones B. & M. Co.
Nuttall Co., R. D.
Star Brass Works.

Whistles, Air.
General Electric Co.
Ohio Brass Co.
Westinghouse Traction Brake Co.

Wire Rope.
American Steel & Wire Co.
Roebling's Sons Co., John A.

Wires and Cables.
Aluminum Co. of America.
American Elec'l Works
American Steel & Wire Co.
Bridgeport Brass Co.
D & W Fuse Co.
General Electric Co.
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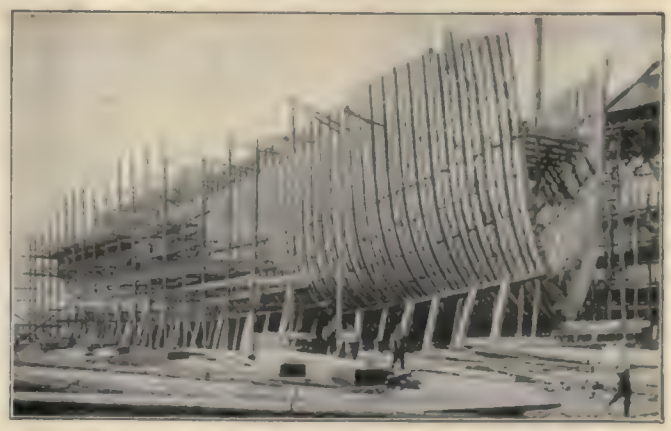
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Efficiency in Emergency Construction—

The proper utilization of materials is quite possible even in a great emergency.

An example of *efficiency* and *practical economy* is shown by the upper illustration. The "faying" surfaces of all timbers have been brush-treated with Carbosota (refined coal-tar creosote oil.) Decay has, therefore, been retarded and the life of the ship materially increased.



Hull of wooden ship in course of construction. Faying surfaces of timbers Brush-treated with Carbosota. Note discoloration at joints. (*Illustration courtesy of the Peninsula Ship Building Company.*)

A recent report referred to the Brush-treatment as follows:

> "The impression is gained that * * * the Brush-treatment of ship-timbers [is] more or less of a fad, which may be performed perfunctorily. There are few places in the ship, however, where, *with the expenditure of a little care,* greater returns on the investment can be expected than in preservative-treatment."

The principle applies to all structures in which structural wood is exposed to conditions favorable to the development of decay.

Brush-treatment with Carbosota, carefully applied, is decidedly worth while and in numerous cases it is the only available means of *protecting wood from decay.*

Barrett's Carbosota Grade-One Liquid Creosote Oil

Carbosota is a pure, refined coal-tar creosote oil, standardized for Non-Pressure treatments. It conforms to the United States Shipping Board Emergency Fleet Corporation Specification 128 for wood-preservative.

Technical assistance and specifications and any other information regarding the Carbosota treatment may be obtained gratis by addressing nearest office.

The Barrett Company

New York	Chicago	Philadelphia	Boston
St. Louis	Cleveland	Cincinnati	Pittsburgh
Detroit	Kansas City	Minneapolis	Nashville
Birmingham	Salt Lake City	Seattle	Peoria

THE BARRETT COMPANY, Limited: Montreal Toronto
Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.



Ship-yards of the Peninsula Ship Building Company, Portland, Oregon. (*Illustration courtesy of the Peninsula Ship Building Company.*)



Completed "Peninsula" type wooden ship built by the Peninsula Ship Building Company. (*Illustration courtesy of the Peninsula Ship Building Company.*)

A Compliment to

Collier Service

at Columbus, Ga.

WE have had a great deal to say about the importance of attractive car cards as a big element in Collier Service.

But we can think of no better proof of the esteem in which Collier car cards are held than that shown by the action of Master Mechanic Loper at Columbus, Ga.

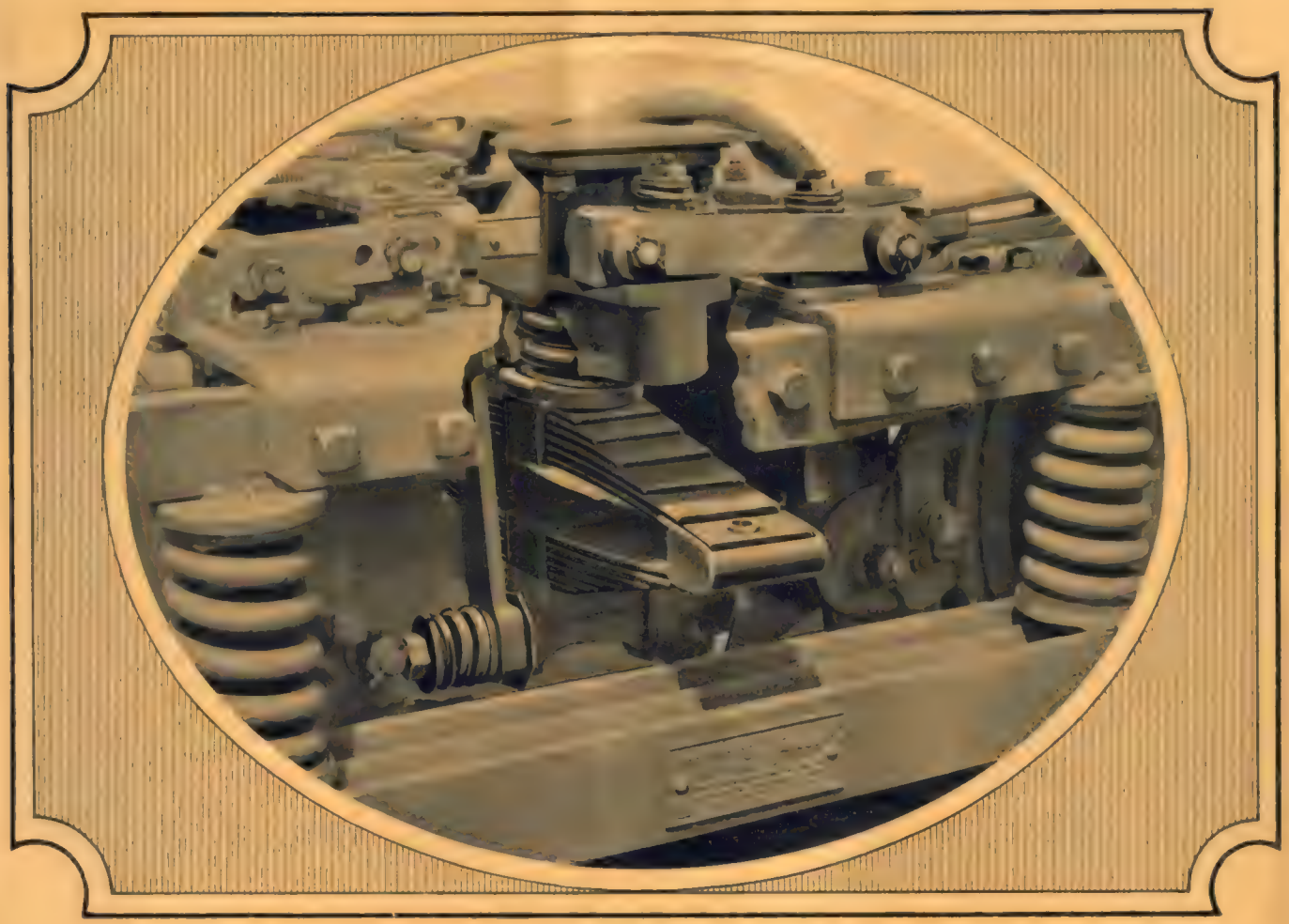
Mr. Loper's office is Car No. 1, the first electric car operated in Columbus. This car is kept carded to date, like the cars in regular service, and these artistic cards add greatly to the attractiveness of this unique office.

Attractive cards make satisfied car card advertisers; and satisfied advertisers insure the stability of the car card space as a source of advertising revenue to the railway.

Barron G. Collier INCORPORATED

Candler Building

220 West 42nd Street, New York City



Establishing a Reputation

YOU know that all Brill standard single- and double-motor trucks have the Graduated Spring System and Bolster Guide. But do you know that these are the greatest improvements in trucks since the solid forged side frame was perfected?

The solid forged side frame gave strength, durability and squareness; the Graduated Spring System and Bolster Guide have perfected spring motion. The illustration shows them as applied to the Brill standard interurban truck—the 27-MCB—with the additional feature, the Swing Link Dampener. These three elements give a smoothness and steadiness to the riding of cars in high-speed service so distinctly different that a reputation is immediately established, a reputation that helps mightily in attracting more riders and developing the riding habit.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

G. C. KUHLMAN CAR CO.
CLEVELAND, OHIO

BRILL

AMERICAN CAR COMPANY
ST. LOUIS, MO.

WASON MANUFACTURING CO.
SPRINGFIELD, MASS.



Saving a Ton

In 1915 the lightest modern electrical equipment on the market weighed approximately 4500 pounds per car.

The Light-Weight Safety Car of to-day has an electrical equipment, consisting of two GE-258 Motors and K-63 control, weighing only 2400 pounds. A ton of dead weight has been removed and yet with this equipment faster schedules are being maintained than was considered possible heretofore.

But the eventual greater economies resulting from the use of light-weight cars and equipment will be found in the use of lighter rails for replacement work, less copper in the feeder system, smaller power station or substation capacity, etc.; a big reduction in overhead costs and investment.

"Some Installations of the GE-258 Motor on Light Weight Safety Cars."

Austin, Dallas, Fort Worth, Texas; Bellingham, Everett, Tacoma, Seattle, Wash.; Cedar Rapids, Keokuk, Oskaloosa, Ia.; McAlester, Tulsa, Okla.; St. Joseph, Sedalia, Mo.; Boston, Plymouth, Warren, Mass.; Atchison, Wichita, Kan.; Centralia, Kankakee, Pekin, Ill.; Colorado Springs, Col.; Meadville, Pa.; Hot Springs, Ark.; Aberdeen, S. D.; Lincoln, Neb.; Vicksburg, Miss.; Ironwood, Mich.; New Albany, Ind.; Chico, Cal.; Madison, Wis.

7558

General Electric Company

General Offices:
Schenectady, N.Y.

Sales Offices
in all large cities

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Company, Inc.

June 29, 1918



The General Electric No. 258 Motors on the safety cars of the Austin Street Railway are SKF equipped. To protect *your* motors from lubrication troubles specify ball bearings marked SKF.



SKF





A Conclusion

"I'm glad you referred me to the 'Electric Railway Journal' of May 11th when you were here last week," said the Vice President. "It is difficult for me to realize just why we have never gone into this freight question before. I am of the opinion that we should make a complete investigation of the freight haulage possibilities in our communities. We must get in touch more with the Boards of Trade and Merchants Associations in the business centers that we serve, and make it clear to them all how effectively we can serve them."

"All right, sir," replied the General Manager, "I am confident that they will co-operate with us. I am going to ask the Westinghouse Electric people to give us the benefit of their experience, and believe that they are in a position to furnish prompt and expert advice. They have standardized freight motors and locomotives, both of which are performing regular freight service successfully on a number of the foremost roads of the country."

"I believe you are right," said the Vice President. "They must have made an exhaustive study of Electric Freight Haulage requirements, before going into it so extensively."

Westinghouse Electric & Manufacturing Co.

East Pittsburgh Pennsylvania

THIS NUMBER CONTAINS THE INDEX FOR VOLUME 51

Vol. 51, No. 26 New York, June 29, 1918 *Pages 1219 to 1262*

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H. W. BLAKE, *Editor*

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Skip Stops Likely for Chicago.
York Wants Six-Cent Fare.
Pittsburgh Goes to Five Cent-Seven Cent Fares.
Ohio Interurbans Act.
Company Publication Enlarged.

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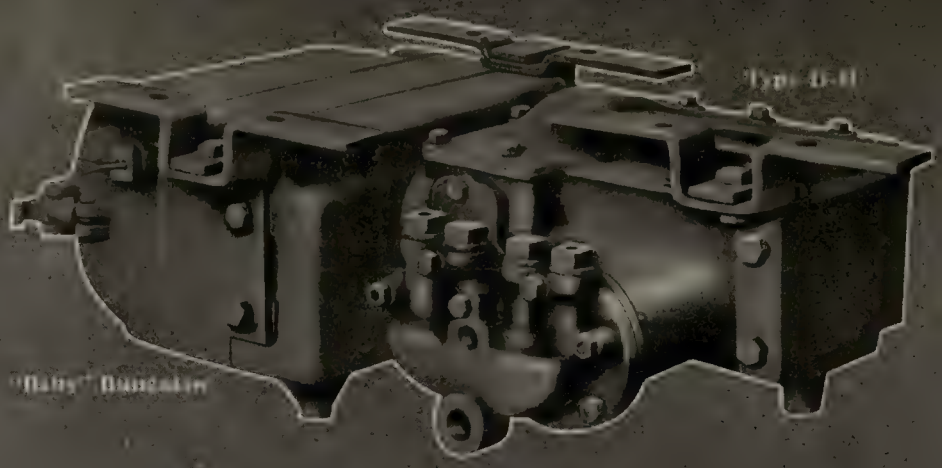
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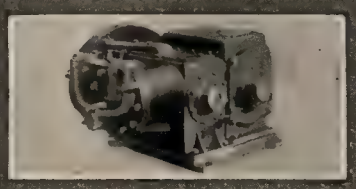
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Air Compressors


Type D-4-K


Type D-1-J

Westinghouse Air Compressors cover a broad field of service. Meet all operating conditions. Can be fitted to any current. Capacities range from 10 to 150 cubic feet per minute. Write to our nearest office.


Type D-2-R


Type D-2-EG


Type D-2-L


Type C-46


Type D-3-[illegible]

Brake Building our Business for a Lifetime

Westinghouse Traction Brake Company

General Offices and Works, Wilmerding, Pa.

Atlanta, Ga.
Boston, Mass.
Chicago, Ill.
Columbus, O.
Denver, Col.
Houston, Tex.
Los Angeles, Cal.
Mexico City
New York, N. Y.
Pittsburgh, Pa.
San Francisco
Seattle, Wash.
St. Louis, Mo.
St. Paul, Minn.

Over the Top

of Westinghouse High-Tension Transformers

Are the Condenser-Type Bushings



The construction of Westinghouse Condenser-Type Bushings is such, that the voltage stress upon the insulation is practically uniform from the surface of the conductor to the grounded flange outside.

The fall of potential is also uniform along the outer surface of the insulation, from the grounded flange toward the point at either end where the high potential conductor emerges from the insulation.

The uniformity of dielectric stress along the surface, and approximate uniformity of dielectric stress in the insulating wall, together with strength of the materials, make a bushing of unusual electric and mechanical strength.

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

Sales Offices in All Large American Cities

W
WESTINGHOUSE ELECTRIC

Westinghouse

Phono-Electric

For SAN FRANCISCO LINE PERFECTION

The United Railroads of San Francisco recently ordered 10 miles of No. 00 round Phono-Electric Trolley Wire.

This wire was used for installation at important intersections where uninterrupted service counts for something.

And, of course, Phono-Electric isn't going in on our **claims,** but on Phono-Electric achievements at San Francisco's hardest place—the double loop at Market Street ferry.

PHONO-ELECTRIC

Users Can Put Off Metal Price Worries for Years

Bridgeport Brass Company

Bridgeport Connecticut



O-B PRODUCTS



O-B Gas-Weld Bonds are particularly suited for paved streets. Only one or two bricks need be removed. The splice-plate is not disturbed—a valuable feature on any kind of rebonding.

O-B Rail Bonds Score Four Big Points

One large electric railway commenced rebonding two years ago and has used for the work a total of 5500 O-B Gas Weld Bonds.

Recently the road reported that due to the O-B Bonds:

It has cut power cost.

It has given better service.

It has reduced the number of burnt-out armatures.

It has kept better schedules.

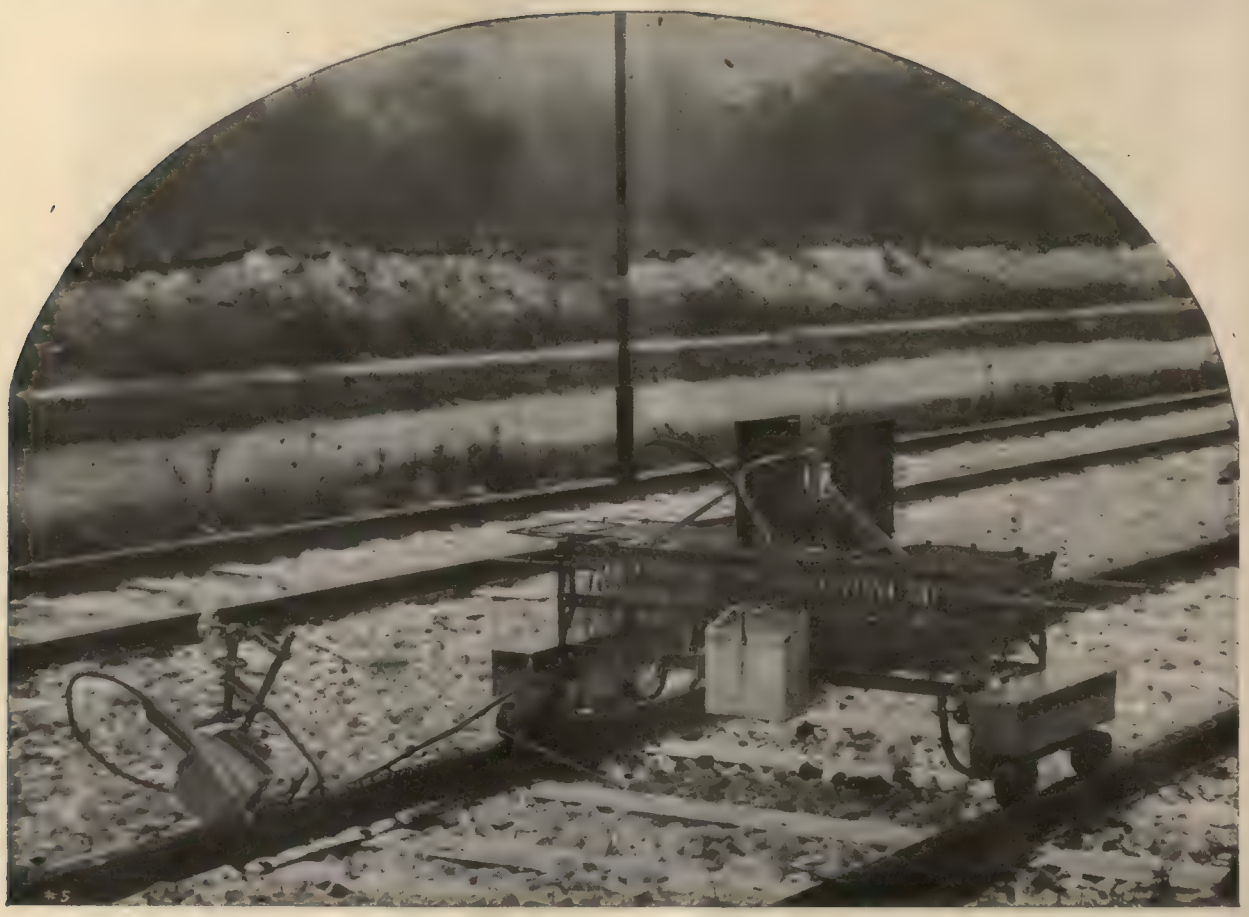
Good bonding always saves money and improves operation. Any O-B Bond is a good bond.

There are several types—one for each condition. Take up your problems with our bonding specialists.

THE OHIO BRASS CO., Mansfield, Ohio

New York Philadelphia Pittsburgh Chicago San Francisco Los Angeles

ERICO
THE LINE OF LEAST RESISTANCE



Where Voltage is Low

as, for instance, at the end of the line, the Erico Portable Welder shows its great flexibility and usefulness as clearly and undeniably as anywhere else along the track.

Switches are so arranged that the outfit will weld rail bonds on voltages from 250 to 750.

Full information on request.

The Electric Railway Improvement Co.

Cleveland, Ohio

Wasted—

35% to 50% of TRACK MATERIAL

INTERNATIONAL
STEEL TWIN TIES

Obviate this wasted material and labor

Of What Engineering Value Is the Concrete or Ballast Between Wooden Ties? Absolutely None. It Represents an Economic Loss of Track Material and Labor.

Steel Twin Ties are designed to overcome just that condition. The effective tie bearing area is placed at the top of the tie and parallel with the rail.

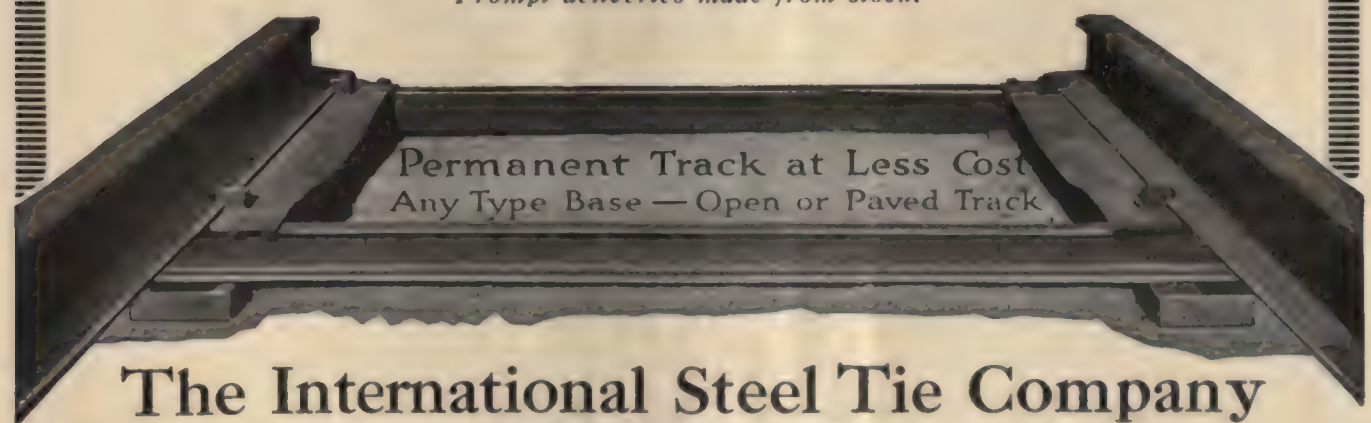
There is an engineering reason for every ounce of metal in a Steel Twin Tie. The 13 in. x 36 in. trussed plates carry the track loads and the 3 in. channels serve as anchorages and tie rods.

Several inches of concrete beneath the tie plate puts just that much in effective bearing. An inch more than is usually used. And at the same time the excavation and concrete quantities below base of rail are reduced one-half.

Any way you look at them they are engineeringly right. The longer you delay your purchase of some of these ties the more money you waste in extraneous track materials and labor.

Ask our users if you want our best sales argument. If you are convinced ask us for a quotation and delivery.

Prompt deliveries made from stock.



The International Steel Tie Company

Manufacturers of Steel Twin Ties and Crossing Foundations

General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

Western Eng'g Sales Co. Los Angeles, Cal. | San Francisco, Cal. Seattle, Wash. | R. J. Cooper Co., Salt Lake City, Utah. | J. E. Lewis & Co. Dallas, Texas. | Maurice Joy, Philadelphia. | William H. Ziegler, Minneapolis, Minn.

AMERICAN ARMCO INGOT IRON

ACETYLENE ELECTRIC

ARMCO WELDING RODS

—the kind that make **safe** welding easy on new construction and repair work.

ARMCO Filler Rods are offered with two strong initial recommendations:

First: Manufacture of the raw iron with the skill and fidelity associated with all products of the American Rolling Mill Co., and

Second: Drawing and control of all finishing operations under direction of the laboratory specialists of the Page Steel & Wire Co.

Together these antecedents mean a reliability and uniformity heretofore not to be had, even in the best grades of Norway and Swedish irons.

ARMCO Rods being 99.84% pure iron, are peculiarly free from the sulphur, phosphorous, slag, oxides and other impurities that ordinarily destroy the homogeneity of the weld by introducing brittle, hard or weak spots, pin holes, blow holes, etc.

A weld made with ARMCO Rods closely approaches the original strength per square inch of the original metal section and lends itself particularly well to subsequent hammering or other finishing treatment.

The standardizing of two ARMCO Rods, one for acetylene and another for electric, *to do well* what has heretofore required a selection of one from ten to twenty grades greatly simplifies welding work, and ARMCO Rods now cost much less than any imported metal of approaching purity.

If interested in modern welding developments you will find it decidedly to your advantage to at least give ARMCO Rods careful test.

Ask us for performance records and reference to important users.

PAGE STEEL & WIRE CO.

Established 1883 *as Page Woven Wire Fence Co.*

Makers of Copperweld Copper Clad Steel Wire; Armco Welding Rods and Electrical Wire; Wire Mill Products, Plain and Galvanized; Wire Fencing for all Purposes; Factory Gates; Wire of Special Analysis; Ornamental Iron Fence; Machine Guards; Tool and Stockroom Partitions; Architectural Iron.

FACTORIES: Monessen, Pa., and Adrian, Mich.

GENERAL SALES OFFICES:
30 Church Street
New York

WESTERN REPRESENTATIVES:
Steel Sales Corporation
Chicago

STEEL AND WIRE PAGE QUALITY PRODUCTS



Car operated by the Richmond Light and Railroad Co., New Brighton, N. Y.

Illuminated Car Signs and "Golden Glow" Headlights—Sure Signs of a Progressive Railway Company

The Richmond Light & Railroad Company know well the great value of Keystone and Hunter Illuminated Destination Signs. Their signs attract riders for them and advertise their service, and besides, make easy the re-routing of their cars.

Their "Golden Glow" Headlights project powerful but soft non-blinding beams of golden light, thus lighting up a path of safety before their cars. In this manner "Golden Glow" Headlights inspire a certain confidence in both operators and riders.

Write for complete data on this equipment.



Typical Keystone Type Sign



"Golden Glow" Headlight Type SR-95

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

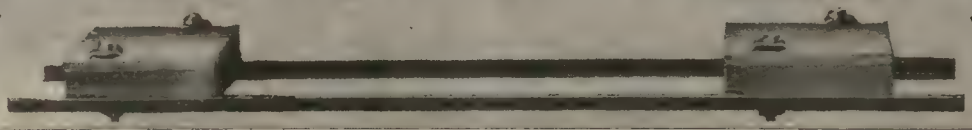
PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

Canadian Distributors: Lyman Tube & Supply Co., Montreal, Toronto, Winnipeg.

The MECHANICAL RAILWAY TIE



The asphalt cushion in D-M Ties saves your rails, your track and your rolling stock

A 6″ Steel I-Beam used as a Tie showed Indentations like THIS!



What must have been the effect on the rolling stock to produce a dent like THIS?

In the above small circular picture is shown a stretch of new track with D.M. Ties, ready for the concrete to be poured in to make a unit structure.



When a steel I-Beam fully 6 in. deep can be hammered and distorted as shown in this picture, enormously powerful blows must have rained upon it. It was the absence of a resilient cushion that made this tie suffer. Such destruction could not have occurred to D.M. Ties, which have wooden blocks, set in asphalt, joined by steel twin bars.

Rigid—Resilient—Permanent.

Ask for details

THE DAYTON MECHANICAL TIE CO.

201 Third Street Arcade

DAYTON, OHIO



These Poles Have Rendered Long and Sturdy Service

Northern White Cedar Poles

Lines of the Chicago & West Towns Railway Company at 64th Ave. South from Ridgeland Ave., Oak Park, Illinois.

Kind of poles—Northern White Cedar
Height—50 and 55 ft.
When set—In the days of the old County Traction Company. No records available.

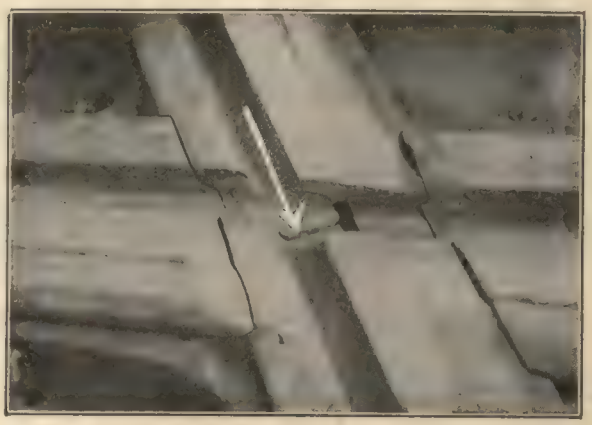
Load carried—13 feeder cables. 350,000 and 500,000 Cir Mils capacity. Leading from Ridgeland P. House.

Present condition of poles is good.

The Chicago & West Towns Ry. connects Oak Park, River Forest, Maywood, Melrose, Cicero, Berwyn, Riverside, Lyons, La Grange & Forest Park. It was formerly controlled by County Traction Company and operated by the Chicago Railway Company.

Northern White Cedar Poles are Light in weight, Easy to Transport and Erect. They make the Sturdy, Serviceable, Attractive line.

Northern White Cedar Association, Lumber Exchange, Minneapolis, Minn.



Main filling or backbone of rolled rail crossing broken at flangeway intersection

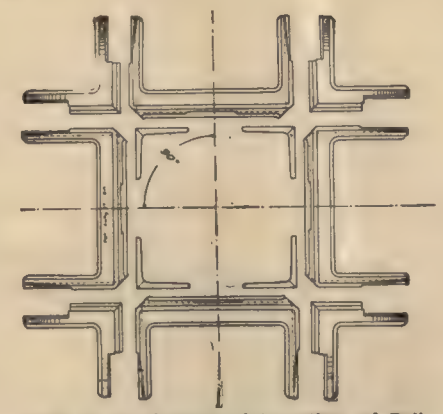
Rolled Rail Crossings

develop frequent fractures at the point shown in the picture to the left. Such breaks are unavoidable because of the lack of flexibility at the flangeway intersections.

Experience has demonstrated that rolled rail wears out in less than one-quarter the time of cast manganese.

As a result these crossings have to be replaced frequently so that their apparent lower first cost, when compared with that of articulated cast manganese crossings, is deceptive.

Balkwill Articulated Cast Manganese Crossings

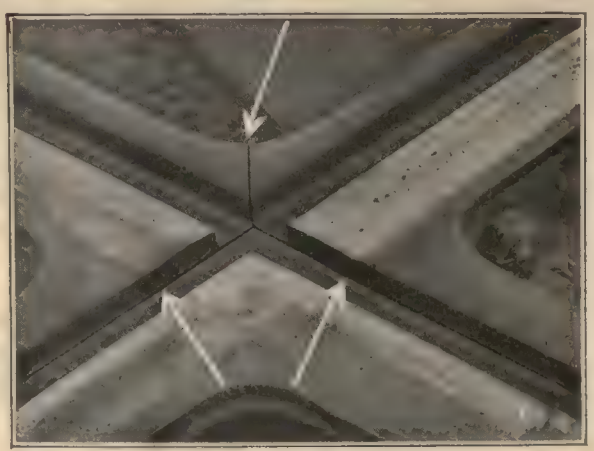


Joints at the flangeway intersections of Balkwill Articulated Cast Manganese Crossings positively eliminate breakage

have scientifically designed joints at the places where breakage formerly occurred. It takes several rolled rail crossings to equal the life of but *one* Balkwill Articulated Cast Manganese Crossing. Therefore the Balkwill Crossing is the cheapest in the long run.

It saves interruption to traffic, makes less demand on labor, which is now so scarce, and also reduces the cost of making replacements frequently.

In other words, it gives you



Joints in Balkwill Articulated Cast Manganese Crossings are life savers. They positively prevent breakage at flangeway intersections, permitting 100% wear before renewal is necessary

MORE WEAR PER DOLLAR THAN ANY OTHER CROSSING YOU CAN BUY

Order Balkwill Articulated Cast Manganese Crossings Direct from Your Special Work Manufacturers

Write us for detail information and list of installations. Don't accept a substitute as there is none.

The Balkwill Manganese Crossing Co.

506 Williamson Building, Cleveland, Ohio

METER YOUR CAR ENERGY—

That's What You Want to Save



On Battleships



On Submarines

The Sangamo Economy Meter Is a Rugged Device!

The Sangamo ECONOMY Railway Meter is a rugged, time-tried device, with an excellent record for power saving. This meter has the same element as in the well-known Sangamo d.c. mercury flotation meters for every electrical service. It is of the same design as the element of the meters which control the lighting equipment on all the cars of the Pullman Company and on several steam railways, and on battleships and all the submarines of the U. S. Government. Sangamo mercury meters are standard on the electric trucks of nearly all manufacturers of electric vehicles.

In fact, the mercury meter is widely used wherever there is need for an electrical energy-measuring device that has demonstrated its ability to withstand the punishment of rough usage, including the jarring incident to electric railway operation.

Economy Electric Devices Co.
L. E. Gould, Pres.

Exclusive Sales Agent
Sangamo Economy Railway Meter
Old Colony Bldg., Chicago

The electrical characteristics of the ECONOMY Meter are guaranteed. Its cost for maintenance as definitely established by one large property over a period of two and a half years, based on the use of 100 meters, is not more than $1.00 per meter per year.

ECONOMY Meters on your cars will decrease operating costs.

The ECONOMY Meter induces saving by a method which does not encourage practices contrary to "safety first."

It will start paying for itself immediately.

Let us send you further details. Write for our new booklet on Efficient Electric Railway Operation.



"The Watchdog of Your Power"

Repairing and Reclaiming
A War-Time Necessity

"The Indianapolis Method"

CONSERVE
Skilled Labor
New Material
Heavy Overhead
Current Losses



RECLAIM
Broken Track
Worn Track
Damaged Frogs
Worn Switches

Portable Electric Welder



The "Simplex" Joint
for High Tee Rails



The "Apex" Joint
for Guard and Girder Rails

The ever-increasing prohibitive price of new material—the excessive cost of skilled labor and the shortage of both, present a difficult problem to the roads.

Trains and trolleys must be kept running. Delays must be prevented. Tracks and switches must be kept in perfect condition.

The logical answer is the Indianapolis Portable Electric Welder, the quickest and most satisfactory of track repairers and reclaimers.

Can be operated by unskilled labor.

Economical in first cost and future maintenance.

Positive in results.

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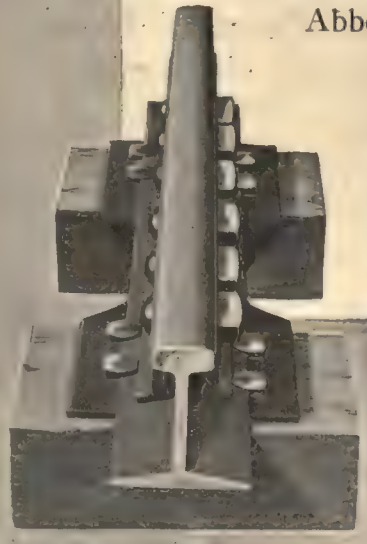
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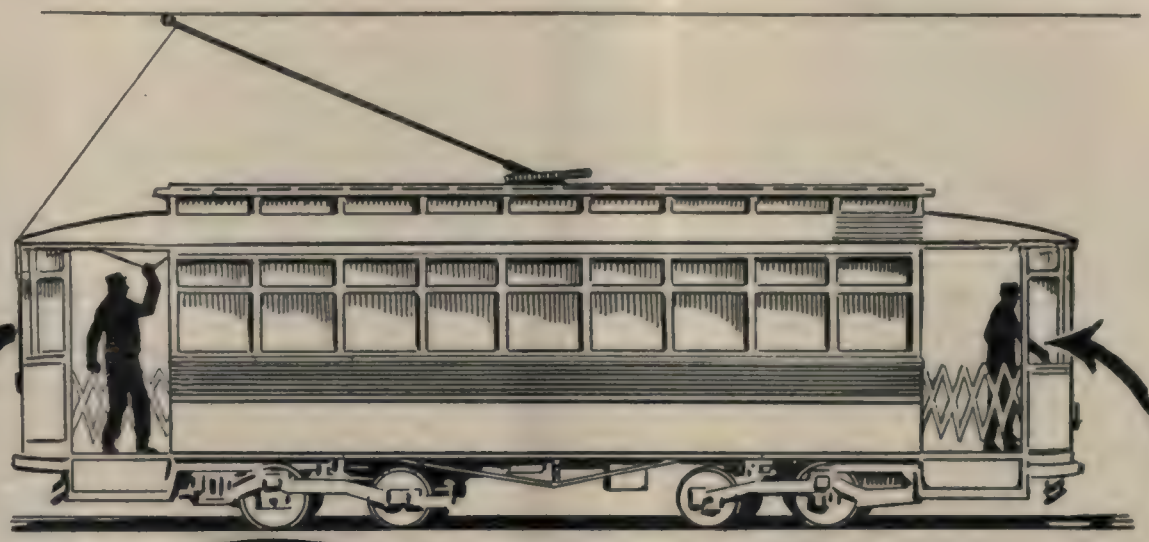
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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 New York, Saturday, June 29, 1918 *Number* 26

The Debacle—or the Dawn

THE future of the electric railway industry may depend upon things which have been going on in Washington this week. The hearings of the War Labor Board, to which we refer on another page, are bringing to the front crucial problems upon which the very life of this industry hangs. Firstly, Messrs. Taft and Walsh have announced that the War Labor Board will take the position that a reasonable wage should be awarded to electric railway employees, regardless of the financial condition of the companies. Secondly, the President of the United States, in his letter addressed to presidents of the telegraph companies, has stated that the decisions and recommendations of the War Labor Board during the war should be followed. Thirdly, the board evidently recognizes that in making wage awards it must do all in its power to secure prompt compensatory fare increases so that its purpose of securing maximum railway efficiency will not be defeated by the ruination of the properties.

It is difficult to see how one can cavil at any of these general propositions. Labor must be paid a fair wage. That should be the fundamental policy of every industrial company. It is not only a matter of justice, but in times like these it is a matter of necessity. Such high wages are being paid in munition plants, steel works, shipyards and elsewhere, and such is the shortage of man power, due to depletion on account of the war draft, that companies which do not pay generous wages cannot compete in obtaining the labor they must have in order to operate. The problem, therefore, is very practical as well as ideal.

It is likewise important that the decisions of the War Labor Board should, as far as possible, be followed. This board was created on behalf of both employers and the working men; it is supposed to represent the most intelligent views of each side. It was created as a patriotic move to help win the war by assuring to both employers and employees that during the war labor matters would be considered in a broad and enlightened manner. The board is composed of five representatives of work-people, five of employers and two representing the public at large. It was stipulated that in all controversies the board should not be regarded as having made a decision unless its opinions were unanimous. Upon failure to reach such a decision, an umpire was to be appointed whose decision should be final. This procedure should be followed, especially in connection with decisions rendered on general questions of policy. We are glad to note that Mr. Taft and Mr. Walsh this week called in the full board to consider the question of recommending fare increases by the federal authorities, and we hope that the same plan will be followed in making all other broad decisions. Companies have the right to insist upon this, and then in turn the board will have the right to insist upon compliance with its decisions by both labor and capital.

Railways Must Not Be Ruined

Yet, to take up the remaining or third point, adherence to such decisions, in the absence of other compensating activities, may mean the wreckage of the electric railway industry. The war emergency, which has placed a great burden of high living costs on the workingman, justifying larger and more generous wages, has borne down equally hard upon the companies themselves; for second to the obligation to pay generous wages to labor is certainly the obligation to return a fair interest payment to those who have invested their money in providing this form of public service. A very large number of people are dependent for their livelihood upon the return from such investments. These very people also have to pay the high cost of living. Their rate of return cannot be increased, but it is certainly fair that it should be maintained.

There is another and even larger aspect of the matter, aside from the justice involved. Communities must have service. The life of the nation must go on. That life is made up of the activities of a great number of communities. The energies of these various communities go into producing those factors with which the war must be won. In some cases this is a direct and, in others, an indirect effort. Not all communities have munition plants and shipyards to and from which work-people must be carried on electric railways, but every community is concerned in the productive life of the nation, and upon that productive life being maintained at its highest pitch of efficiency depends our ability to win this war. Electric car service, therefore, is a vital necessity in helping to win the war. Such service must be given to the public in full measure and at all hazards.

Electric railway managers have of late been forced to an absolutely false position. They have been com-

pelled to resist demands of labor, not because they did not oftentimes recognize the justice of those demands, but because they could not see where the demands could be met with due regard to their obligations to give public service and to meet their fixed charges. Such railroad managers have also been placed in a false position toward investors in their property, the investors having a right to expect that a fair return would continue to be paid upon their investment and that managers of properties would avoid, at all hazards, allowing their companies to go into receivership.

Appeals have been made to state legislatures, to municipalities, to commissions, to courts and to Washington, but all practically without avail. The rigidity of the fixed fare has been largely maintained, although there have been a few exceptions. Many of these exceptions, however, have been of such a character as practically to nullify the apparent generosity of communities. The way in which the hands of companies have been tied in places like Buffalo and New Orleans is absolutely unjustified from any statesmanlike point of view. Municipalities find electric railway companies completely at their mercy, and municipalities are acting, in many cases, in a spirit of the sheerest Bolshevikism.

It is undoubtedly true that many of the companies find themselves bound hand and foot with franchise restrictions which, if pushed to the limit, mean inevitable strangulation. Then come along courts like the Court of Appeals in New York State, saying that commissions with power from the state to decrease rates of all kinds, franchise or no franchise, cannot permit rates to be raised if the franchise stands in the way! There is thus put in the hands of petty politicians in municipalities throughout the United States a political weapon which many of them are not slow to use.

For example, Mayor Hylan in New York City is frankly in favor of municipal ownership and operation. He claims that the election in New York City last fall practically indorsed that policy. The New York Legislature refused to pass a bill making it possible to municipalize railroads in New York State. Mayor Hylan, however, sees in the distress of the New York electric railways an opportunity to force them into bankruptcy. These companies cannot get increased revenues without permission of the Board of Estimate, which is likely to follow the Mayor's initiative. Withholding justice will ultimately mean bankruptcy for all companies in New York City if present tendencies go on unchecked. It is conceivable that investors, seeing their properties deliberately wrecked by such tactics, might, as a last resort, actually invite municipalization, in order to save something rather than, for the sake of a principle, allow the last increment of their equities to be melted away. But what can be said of the morality and the honesty of such a policy on the part of a city official? And Mayor Hylan's case is not unique.

Contemporaneous with all this is the necessity many companies are under to undertake new financing, or, at any rate, to refund securities in this year. We understand that about $125,000,000 in electric railway securities must be refunded. The War Finance Corporation has taken the position that it cannot refund or finance corporations which are not thoroughly solvent and that, in any case, the financing should be done by banks and then perhaps rediscounted through the War Finance Corporation. Even in the case of the Brooklyn Rapid Transit Company, where the War Finance Corporation did come to the measurable relief of the company, the obligations imposed were such that the company had to stop all dividends. Thus the attitude of the government to-day is that, while the public is forcing the companies toward bankruptcy, the government and the public will not assist in financing a company which, even by reason of the emergency of the war, is or threatens to be bankrupt.

This Is What Confronts You

Briefly, then, the electric railway industry is faced with a demand expressed through a public agency, the War Labor Board, for increased wages for its men; it is faced with a demand from the public for the highest possible grade of service to help achieve the supreme public necessity, that is, to win the war; yet the public refuses to permit it to raise its charges so as to meet its increased obligations and, in the case of companies which must be refinanced, refuses to assist them in their difficulties.

It is no wonder that the country has seriously considered whether or not it would not be wise for the President to assume partial control of electric railways. This is frankly a counsel of despair. It is not necessary in order that the public may have the service or that duplication of effort may be avoided, as was necessary in the case of the steam railroads. The only possible necessity for the President taking over the electric railways of the United States would be because municipal and local authorities refused to allow companies to earn sufficient revenue to enable them to give adequate service, to pay adequate wages and to obtain necessary capital with which to continue their work.

Why Federal Action Must Come at Once

Is it not a tragedy, one of the supreme tragedies of this war, that this country should have had to face this question: "Must the President of the United States, as an act of statesmanship, be forced to grant federal relief simply because authorities in localities and municipalities prefer to play petty politics rather than frankly face the needs of the hour?" There was never a greater call to local authorities to manifest statesmanship in national and city affairs. It would be a great pity if the President had to exercise control over utility rates, for it would take away from municipalities that restraining influence which their authorities ought to be able to exert on the operations of their local utilities.

Nevertheless, the record of local authorities during the last few years is not such as to inspire any confidence that in general they will deal speedily with

utility fare increases unless strongly pushed by the government. But there must be no dilatory action in handling this fare question; if wages are substantially increased, more revenues must simultaneously be secured or in all likelihood the whole industry will be thrown into a panic. The situation, therefore, demands federal action. A national agency, empowered to intervene in local situations in case the cities or commissions refused immediate relief, would give an opportunity for the exercise of local patriotism and at the same time insure the railways against disaster.

MEET THE SITUATION SQUARELY

Let the War Labor Board consider the electric railway labor problem from the point of view of what wages the men should receive. Obviously it cannot be considered on the basis merely of what the companies are able to pay. Let it rather be dealt with from the point of view of what the companies should be able to pay. Let the national authorities at the same time tell local regulatory bodies in specific terms what they should do, and provide an agency with mandatory powers to intervene in case the local authorities fail to do their duty in a spirit of statesmanship and generosity.

As to the exact manner in which the federal government might assume control of the fare situation, several practical ways could be devised whereby local conditions would be met. Clearly, it would be unwise to make any blanket increase of fares. Each community must be dealt with on its own merits. One practicable scheme might be for the President formally to take over the fixing of electric railway fares and then transfer his powers in that respect to the public service commissions in the various states. The commissions would then act not by virtue of their state powers but directly on behalf of the President in the exercise of his war powers, and there could be no such conflict as has recently arisen over the power of commissions as against municipal franchises. Another practicable plan would be the appointment of an electric railway administrator, whose duties would be to act on behalf of the President in seeing to it that the electric railways have sufficient funds to be able to maintain their service, pay adequate wages and attract new capital.

In either of the foregoing plans we should assume that the War Labor Board would fix the wages in accordance with local conditions or would supply local agencies to fix these on its behalf. Indeed, the War Labor Board might transfer its functions, as far as electric railway wages are concerned, to local representatives of the electric railway administrator or to the local public service commission. There is every reason why the functions of establishing wages and of fixing fares necessary to earn those wages should be concentrated in one head, just as has been the case in the steam railroad industry, where the whole matter is in the hands of Mr. McAdoo. There is one cautional signal, however, which should be displayed at once lest later it become a danger signal and even a catastrophe result. Additional revenue must be obtained, but there is a good deal of difference between raising the basic fare and obtaining sufficient revenue to achieve the purpose in mind. It has already been the experience of a number of companies that the percentage of increased revenue after the fare was raised was not so great as the percentage increase in the fare itself. In other words, the increased fare has tended somewhat to reduce business. The situation must be regarded, therefore, from the point of view of revenue exclusively.

The die is not yet cast. The War Labor Board has not yet announced its formal decision regarding a recommendation to Congress or the President for fare aid to electric railways. The moment is critical, and we earnestly hope that this board and other government powers will meet the issue with vision. Let their act be the Dawn of a new day—not the beginning of the Debacle.

Insurance Against Obsolesence Is a Prime Necessity

AT THE MOMENT there is a great deal of "marking time" in the matter of putting rolling stock, power equipment and the like into an up-to-date condition. It should always be in this condition to enable the railways to give first-class service, which after all is simply effective and courteous operation of equipment.

When one inquires as to what is new on almost any electric railway property to-day he is met with the reply: "Oh, we are just trying to keep things moving, that's all." Really, that's about all that can be done under present conditions of high prices, scarce labor and limited resources, but a great deal more ought to be done even in war time. It can be done only by removing the limitations upon resources.

The indications are that the war will be a long one, but even if it should end this year a long period of high prices is still ahead. In the meantime track is running down, obsolete motors are "eating their heads off" in expensive maintenance and energy consumption, and power plants are operating with antique engines and boiler equipment and without essential labor-saving devices, etc.

There is no standing still in the electric railway business any more than in another, and if we are not going forward we are of necessity retrograding. Railway managers understand this condition all too well, but the facts are not fully appreciated by the public. One would think that people would realize that necessarily neglected track joints and special work, for example, produce discomfort in riding and reduced schedule speed, while at the same time they react unfavorably upon the equipment, the power plant and the track itself. What is true with regard to repairs is just as true in the matter of replacements and betterments. If a machine or a device of any kind is uneconomical it should be replaced, provision having been made for such a contingency in advance.

In their balmier days the electric railways were prompt to avail themselves of the advances in the design of all kinds of equipment and they deserve recognition and

reward for this in the form of liberality in fare adjustments, taxes and general obligations. That most of them cannot do so at present is due to lack of understanding of the circumstances rather than penuriousness on the part of the public. But whatever has or has not been done in the past, something must be done now and done right speedily.

New Partnership Features Contained in Tentative Chicago Consolidating Ordinance

ANOTHER long-pending controversy appears to have been carried a considerable way toward a business-like settlement by the action of a sub-committee of the Chicago City Council recently. The ordinance for consolidation of the elevated and surface lines of that city was approved by the sub-committee and accepted by the utility representatives on June 19. It now needs favorable action by the stockholders, as well as in the main committee and in the Council itself, after which the measure will be submitted to popular referendum. If again indorsed there, the final steps must be taken in the State Legislature. While these necessary steps will defer final outcome for some six months, the attitude of the local newspapers and of the thinking people of the community lead to the hope that improved service is to be made possible in Chicago and that the city is to have effective power of control over local transportation.

As usual, the tentative ordinance is the result of a compromise in which neither party gets all that it was seeking. The people, however, in the event that the measure becomes law, are assured the benefit of traction consolidation and betterments which can be produced by the expenditure of some $300,000,000 during the thirty-year life of the franchise. The elevated lines with proposed subway connections are to serve their real intended purpose of rapid transit, taking more and more of the long-haul traffic from the surface routes. The latter, already covering about 500 miles of streets, are to be developed to a greater extent and serve as feeders. People who have been paying 10 cents when using the surface and elevated lines jointly are to get such service for 7 cents, and there is to be no curtailment of the present generous transfer privileges on either system.

The men who framed the ordinance were also guided by experience with a fixed fare and have wisely provided for raising or lowering the rates as costs demand. Thus they have assured protection also to the investor who is to have a guaranteed return on capital. Chicago was the first city to adopt the partnership principle in a contract ordinance. During the past eleven years the surface lines system has been brought up to a standard of maintenance which is perhaps not excelled by any other property in the country. The city meanwhile has been getting its 55 per cent of the profits, and has accumulated a fund amounting to some $24,000,000. The mistake of not putting this money to some effective use has, however, been appreciated for some years past, and the new arrangement will provide for the more modern practice of amortization. Thus, the people in years to come may have the choice of taking over the lines without the use of funds other than the surplus earnings of the property.

The proposed franchise is an improvement upon the Kansas City ordinance which had the handicap of a fixed fare, and also upon the Cleveland measure which had a limit to its flexible fare. It is more like these enactments in having a guaranteed rate of return. It differs from the Dallas ordinance which has also a limit to its sliding scale of fares. It has features more like those of Philadelphia and Boston in this respect. It is novel in providing that labor as well as the municipality should have a vote on the board of directors.

Representatives of the city and the companies are to be congratulated in taking these steps to bring order out of chaos. Time appears to be an important element in bringing the matter to a conclusion, and those who have the interest of the traveling public at heart should not place any further obstacles in the way.

The Right Man Can Be Found Within the Organization

PUBLIC management of the Boston Elevated Railway will be of interest to the entire electric railway industry on account of the unusual opportunity to observe the working out of a bona-fide service-at-cost plan. We say bona-fide because the Boston arrangement is unique in its enlistment of the public credit to guarantee a stated return upon the investment in case the rates charged prove insufficient. This provision is a remarkable tribute to the integrity of the management over a long period of years, and it means that honest capitalization is to be fairly rewarded even though a draft upon the tax levy may be required. The significance of this provision to the industry is fundamental.

Active management of the railway will soon be in the hands of the board of public trustees just appointed by Governor McCall, and from them the public will expect much. In the interest of all concerned it is now most important to avoid administrative experiments, because public convenience and necessity demand maximum efficiency. Waste of money through incompetent, inexperienced or dilettante conduct of affairs would be intolerable, for to-day every dollar in public service work should yield one hundred cents worth of results.

The Boston Elevated Railway should be directly managed, under the supervision of the public trustees, by an executive knowing the property from A to Z. It has been hoped in Boston that President Brush could be persuaded to remain at the head of the company under the new regime, and a resolution to that effect was recently passed by the City Council and addressed to the incoming trustees, a most unusual compliment in itself. It seems likely, however, that Mr. Brush will find it difficult, if not impossible, to decline all the tempting and pressing calls to enter other lines of work. In such case the public trustees will do well to look for his successor among the several high-grade and efficient executives who have been associated with Mr. Brush, for the success of the property under State control will depend quite as much upon the skill with which its chief executive deals with its complicated operating problems as it will upon the soundness of the general policies laid down by the trustees themselves.

Raise Rates to Permit Higher Wages

Living Wage Must Be Paid, But War Labor Board Should Not Disregard Financial Condition of Properties—Federal Aid Is Needed to Secure Compensating Revenue Increases, and President Has Power in War Emergency to Raise Rates—Further Assumption of Control Is Neither Necessary Nor Desirable

WHAT EFFECT, if any, should the financial condition of electric railways have upon the determination of reasonable living wages by the War Labor Board? To this fundamental question, more important than any other today confronting the industry, representative operators have been devoting their attention this week at hearings before the board in Washington. The consensus of opinion seems to be that the War Labor Board should make what in its opinion are proper wage awards but that, in so doing, it should also use every means in its power to secure for the railways corresponding increases in revenues. Increased wages without higher rates would mean the ruination of the properties, in view of the present abnormally high operating ratio and the preponderately large part played by wages in operating expenses.

As to how the War Labor Board should help to secure adequate rates, it is the opinion of railway men that this board should seek to secure direct federal aid through the President or Congress. During the week the sentiment has been developing that the electric railway situation calls for prompt and radical action at the hands of the national government. This feeling finally, at the request of the War Labor Board, gave rise to the submission of a finding, approved by both railway and union representatives, that not only Congress but also the President has power to increase electric railway fares.

Direct aid by the federal authorities, it is felt, would by no means require government operation, for the primary purpose would be not to create unity of operation, as in the case of the steam railroads, but rather to secure justice for individual utility owners and maximum utility efficiency for the nation. These results could be obtained by continued private operation, with government supervision of rate-making for the purpose of securing general and expeditious relief.

What the Electric Railway War Board Finds

1. Congress has the power, in times of war and national emergency, to regulate electric railway fares.

2. Under existing legislation, the power has been conferred upon the President to regulate such rates.

3. An emergency exists—brought about by the extraordinary war increase in costs of labor and materials—which calls for the immediate exercise of this power by the President.

4. If prompt relief is granted by way of an increase in fares, it will not be necessary for the President to exercise the further power of taking over the possession and operation of these properties.

This Is of Vital Concern to Every Company

Lest electric railway operators should think that the discussion of such points is purely academic, it would be well to add that the War Labor Board, according to an official announcement, intends to adopt a definite policy on the question of the financial ability of the carriers to pay higher wages. Furthermore, the board is seeking enlightenment in regard to the living wage, as a preliminary move to the establishment of a minimum wage rate commensurate with the increase in the cost of living necessities. The policies formulated by the board in these matters will be of great importance not only to companies in Chicago, Ill., Newark, N. J., Detroit, Mich., Cleveland, Ohio, Schenectady, N. Y., East St. Louis, Ill., Portland, Ore., Pittsburg, Kan., and Joplin, Mo., which are directly concerned because of pending wage negotiations before the board, but also to the electric railway industry as a whole.

What constitutes a living wage was barely discussed at the first sessions. It was evident, however, that the employees will try to show what should be a minimum wage, when the increased cost of food and other necessities is considered, and then what constitutes a reasonable wage on electric railways, when wages in other industries in the same localities are taken into account. For instance, as this paper was about to go to press, the men were introducing as relevant evidence the fact that most of the building trades in Chicago were receiving 70 cents an hour in 1917 and 80 cents an hour in 1918. These later sessions, however, will be covered in detail in next week's issue.

What the Board Wanted to Know

The hearings before the War Labor Board began on June 24 before the joint chairmen, William H. Taft and Frank P. Walsh, to whom have been assigned the pending electric railway wage cases. Mr. Taft, in opening, stated that the board wished to hear argument upon two points: (1) What recognition should the board, in making wage awards, give to the financial status of the companies? (2) What is a living wage? He said that a number of specific questions had been submitted to the board as arbitrators in various cases, that general questions had also been presented and that some cases had not yet been assigned for arbitration. Before any of the points in question were settled, however, Mr. Walsh and he thought it best to take up the two above-mentioned issues, in which all are interested.

The first speaker for the companies was Thomas N. McCarter, chairman of the Electric Railway War Board

and president Public Service Corporation of New Jersey, Newark, N. J. Mr. McCarter's remarks are abstracted on pages 1227 and 1228. In response to a query from Mr. Taft, he said that commissions are slowly responding to the appeals of the companies where they have the power to act, but that it is more difficult to deal with municipalities. If the War Labor Board should see fit to make recommendations in regard to fare increases, he felt that it would be very helpful to have this done with the approval of President Wilson expressed most explicitly.

NET INCOME OF RAILWAYS IS VANISHING

The declining earning power of electric railways was ably described by P. H. Gadsden, resident Washington member of the Electric Railway War Board and president Charleston Consolidated Railway & Lighting Company, Charleston, S. C. In his opinion, utilities today have three great problems. First—and fundamental—they need substantially increased revenues to meet the extraordinary increases in all operating costs. Second, they must refund $225,000,000 of securities (more than one-half is for electric railways) during this year in a time of a practical governmental monopoly of the money market. By July 1 $100,000,000 of securities will have matured without being refunded or otherwise provided for. Third, the utilities are confronted with extraordinary demands for increased facilities to help carry out the war program. From $100,000,000 to $200,000,000 of new capital must be found in 1918 for additional facilities.

In the face of these problems the utilities are doomed to destruction unless relief is afforded. The electric railways are in the worst condition. During the first three months of 1918, as compared to 1917, the gross operating revenues of 108 leading companies gained $1,500,000 or 2.4 per cent, but the operating expenses increased $4,978,000 or 11.7 per cent and the net income fell off $4,045,000 or 76.5 per cent. These figures were obtained from companies having 40 miles of track or more. The smaller railways have probably suffered worse.

The operating ratio of the 108 companies for the last few years were as follows: 1913, 60.78 per cent; 1914, 61.85 per cent; 1915, 62.81 per cent; 1916, 62.84; 1917, 66.37 per cent; 1918 (first three months), 70.5 per cent. This record, Mr. Gadsden averred, shows that the income of the companies is being progressively eaten up by the rising expenses of operation. By this time next year, at the present rate of decline, the net income will have reached the vanishing point.

Mr. Gadsden said that electric railways must have more revenues but that the ordinary methods of securing relief are too slow. Direct federal action is needed, and this is possible because when an industry becomes of national importance in war time Congress can assume regulation thereover. Hence, Mr. Gadsden stated, if reasonable consideration on the part of the War Labor Board shows wage increases to be justifiable, the board should recommend to the President that proper steps be taken through a federal agency to increase rates. In Mr. Gadsden's opinion, federal aid for utilities during the war period would not be ill received by commissions and cities.

In closing he suggested that arbitrations by the War Labor Board would be more effective if the board could get the commissions and municipalities to agree in advance to support the awards. This might be done in many cases but not all.

GOVERNMENT OPERATION IS NOT NECESSARY

J. S. Clark, of E. W. Clark & Company, Philadelphia, Pa., said that the railways have no quarrel with the men as to the necessity for a living wage, but should the War Labor Board, by deciding upon wage awards, expedite the destruction of the utilities? The answer to the question lies in higher rates, which experience shows mean higher revenues.

Mr. Clark believed that Congress has power to provide an appropriate remedy to meet the national need for going utilities. The act providing for the taking over of the steam railroads authorized the assumption of control over any transportation system used in direct war work or for any other purposes connected with the present emergency. Furthermore, although nothing in the order of the government was to be constructed as affecting electric railways, it was stated that by a subsequent order, if and when it should be found necessary or desirable, possession, control or operation of such carriers might be taken.

In the case of the steam lines, Mr. Clark pointed out, the operation had to be for government account, since only by this method, under a suitable agreement for compensation to the carriers, could the readjustment of facilities for the best transportation of troops, other passengers and freight be accomplished without injustice to individual lines. In other words, the purpose of taking over the steam railroads could only be served by unified operation on government account.

The utilities, however, are entirely different, for they serve separate communities and do not need to be operated together to secure war efficiency. It would be sufficient for government purposes merely to have the rates increased. Even if the government should take over the operation of the utilities, however, it would be necessary to do so only in a supervisory way. Each individual utility could be operated under national control for the account of its owners, not the government, and the operating personnel could remain unchanged.

COMPANIES CONCEDE JUSTICE OF FAIR WAGE INCREASES

Andrew Squire, counsel for the Cleveland (Ohio) Railway, covered both questions raised by Mr. Taft, but his remarks regarding a living wage will be noted later. On the subject of the general justice of higher wages, the brief filed by Mr. Squire said: "The company concedes that the men are entitled to an increase in the wage scale because of the sudden and unexpected increase in the cost of living brought about by conditions beyond the control of either party."

In amplifying this statement, however, Mr. Squire emphasized the point that the financial condition of the company should not be disregarded. When the War Labor Board decides what will be a reasonable wage increase, the public must pay the bill. Mr. Squire agreed with the general proposition that fair wage awards should not be restricted by the present inability of companies to meet wage increases, but that, on the other hand, the War Labor Board should tell the

public that it must grant a sufficient fare to enable the companies to pay such wages

W. W. Gurley, general counsel Chicago (Ill.) Surface Lines, was of the opinion that the employees are entitled to fair wages, and presumably the War Labor Board will act along remedial lines if the proof shows that wages should be increased. Any award, however, will simply raise the practical question of payment, and a substantial increase will lead necessarily to the financial disaster of the Chicago surface railways.

Mr. Gurley suggested that the War Labor Board should make a strong recommendation to commissions and municipalities in regard to their patriotic duty in permitting adequate fares. He felt that the city authorities in Chicago would be influenced by such a declaration from the national board and would look upon a fare increase as a war necessity. He said that he had made no examination as to the power of the President to grant direct federal relief.

Getting Together for Federal Relief

The continued hearings on June 25 resulted in a more detailed discussion of the part the War Labor Board should play in securing higher fares. The subject was brought up in the opening argument for the union leaders, when Jacob C. Le Bosky, Chicago, Ill., stated that the companies must pay reasonable wages in spite of their financial condition, and that the obtaining of rates is a problem for them to solve. This same idea, it may be noted, was expressed in a brief filed by the Cleveland and Detroit locals of the Amalgamated Association of Street and Electric Railway Employees of America, in which the following statement was made:

"The financial condition of the companies has nothing to do with the issue which the War Labor Board is called upon to decide. After fixing a living wage for the employees, which is the sole arbitral issue, the function of the board upon this matter has been properly performed. If the companies cannot pay sufficient wages 'to insure the subsistence of the worker and his family in health and reasonable comfort,' they can get relief through the proper channels. The public will have to pay more for transportation if necessary. As Oscar S. Straus has said, 'rates should be subordinate to wages and not wages, as now, subordinate to rates.'

"If a company is not paying any dividends, if it is unable to pay its bond interest and in consequence is thrown into the hands of a receiver, even then that company ought to pay a living wage to every one of its employees. This is the accepted policy everywhere. It underlies all statutes relating to mechanics' liens, and the somewhat kindred statutes whereby labor is made a preferred creditor in cases of bankruptcy."

While the men at first thus considered the condition of companies an irrelevant matter in wage determinations, Mr. Le Bosky went on to say that happily the railways have avenues of relief open and that the employees will do nothing to oppose the granting of proper aid. In his opinion the national government has ample power, whether now expressed in legislation or not, to take the utilities under its protection.

This statement led Mr. Walsh to suggest that the War Labor Board would be materially aided if the representatives of the companies and of the unions would get together and ascertain what power of this sort the national government really has under existing legislation. Mr. Walsh said that the prime necessity is for utilities to have men for operation, and these should not be asked to make sacrifices below reasonable wages. In view of the apparently serious financial condition of the railways, however, perhaps the time has come to declare a general truce on controversial points between cities and railways and let the President increase fares at once in order to keep electric railway employees in their essential employment and insure maximum utility efficiency.

After some discussion as to what was the real understanding between all parties as to the relevancy of the financial condition of the railways, Mr. Taft summed up the situation, without an expression of dissent, as follows: The War Labor Board, which is empowered to act only in arbitrating wage disputes voluntarily submitted to it, is impressed with the arguments concerning the awkward position of utilities. The main purpose of the board is to keep war industries in operation, and if by wage awards the cessation of operation should be caused, the purpose would be defeated, however just the awards might be as abstract propositions. Hence, although it is the duty of the board to fix reasonable wages, despite the poor financial condition of utilities, any awards made should be accompanied by a recommendation for fare action by the proper authorities to prevent the awards from being nullified and maximum production from being injured.

Mr. Walsh believed that legal authority might be found for federal control of utility rates, in principle at least, and he stated that if the lawyers of both parties would look into this point the board might be in a position to recommend Presidential action or immediate legislation. Accordingly the session was adjourned so that during the afternoon and evening the union and railway representatives, as they said they were willing to do, might work up the most direct plan for having the national government meet the present utility emergency by increasing fares. Possibly, the chairmen suggested, a federal committee, agent or rate administrator might be authorized by the President or Congress to investigate individual cases and grant the relief needed.

President Wilson Can Raise Rates

As the result of this joint conference the War Board of the American Electric Railway Association on June 26 presented to the War Labor Board a brief covering three propositions, as follows:

1. Congress has the power, in times of war and national emergency, to regulate the rates of fare to be charged by electric railways.

2. Under existing legislation, the power has been conferred upon the President to regulate such rates of fare.

3. An emergency exists which calls for the immediate exercise of this power on the part of the President.

The brief was signed in concurrence by James H. Vahey, counsel Amalgamated Association. In fact, all the conferees were in favor of the conclusions reached except Fielder Sanders, street railway commissioner of Cleveland, who said that the director of law of that city wished to present argument later in regard to the local situation. City Counsel of Detroit, however, stated that

his position was in accord with that of the conference, for the cars must be kept running. Some constructive action must be taken, and if a federal rate increase is the only solution it must be adopted.

The facts and citations of law set forth in the brief are shown in the following abstract:

1. The fact that the operations of any industry under the exigences of war have become necessary and essential to the nation's welfare immediately impresses upon that industry a national character and justifies the federal government in exercising the federal power to regulate and control. The power of the federal government over an industry in time of war rests not upon the fact that such industry may or may not be engaged in interstate commerce, but upon the more comprehensive bases that such industry, under the demands of war, has become necessary to the nation's welfare. When such a situation has been created, the power of the federal government, certainly during the period of the war and for a reasonable time thereafter, is paramount to that of the state.

In pursuance of these principles, we have seen the government progressively fix the prices of wheat, milk, sugar, etc., through the Food Administration; of anthracite and bituminous coal, and of coke, through the Fuel Administration; of pig iron, aluminum, steel, cement, lumber, hides and leather, and a large number of other basis articles, through the price-fixing committee of the War Industries Board. Within the last few weeks a Textile Administrator has been appointed, with large powers over the entire textile industry of the country. Prior to the war the federal government did not possess the power to regulate the prices of these articles. How has it been derived? From the increasing necessities of the situation. As each article in turn becomes more and more necessary to the nation's welfare, and more and more intimately connected with the prosecution of the war and the needs of the war program, it comes within the sphere of federal control.

The power exists in Congress to fix rates of electric railways. We have seen this power exercised in recent months in the case of the steam railroads. A large increase in rates has recently been ordered, applicable to both interstate and intrastate rates. This power in Congress to fix intrastate rates did not spring from the fact that the government took possession of the railroads, but existed because of the paramount power and duty to carry on the war. Rate-making was in that case, as it is in this, a necessary war measure, and the power thus to fix rates exists independent of any other power to take over or operate such properties.

Within the last four months, the fact that public utilities are directly contributory to the conduct of the war and are essential to the nation's welfare, has been recognized officially by practically every department of the government, executive and legislative. Moreover the Act of Congress, entitled "An act to punish the wilful injury or destruction of war material, or of war premises or utilities used in connection with war material and for other purposes," commonly known as "the sabotage act," approved April 20, 1918, expressly includes electric railways. War utilities are defined in that act as follows:

> The words shall include all railroads, railways, electric lines, roads of whatever description, railroad and railway fixtures, * * * or any other means of transportation whatsoever, whereon or whereby such war materials or any troops of the United States, or of any associated nation, are being or may be transported either within the limits of the United States or upon the high seas.

The power of Congress to regulate electric railway rates in times of war and national necessity was recognized and exercised during the Civil War in an "act to provide internal revenue to support the government, to pay interest on the public debt, and for other purposes," approved June 30, 1864, (Thirteenth U. S. Statutes at Large, page 223), as follows:

> And be it further enacted, that every person, firm, company, or corporation owning or possessing or having the care of management of, any railroad, canal, steamboat, * * * or other vessel, or any stage-coach or other vehicle engaged or employed in the business of transportating passengers or property for hire, or in transporting the mails of the United States, or any canal, the water of which is used for mining purposes, shall be subject to and pay a duty of 2½ per cent upon the gross receipts * * * provided, that all such persons, companies, and corporations, shall have the right to add the duty or tax imposed hereby to their rates of fare whenever their liability thereto may commence, any limitations which may exist by law or by agreement to the contrary nothwithstanding.

2. If the President be advised that Congress has not as yet passed the necessary legislation and conferred upon him authority to regulate the rates of fare of electric railways, we respectfully urge the War Labor Board to request the President to seek from Congress such additional legislation as to give him the power referred to.

3. But we contend that Congress already has conferred upon the President the power to regulate the rates of electric railways by:

(a) An act making appropriations for the support of the army for the year ended June 30, 1917, and for other purposes, approved Aug. 29, 1916 (Compiled Statutes, page 3778), in part as follows:

> The President, in time of war, is empowered, through the Secretary of War, to take possession and assume control of any system or systems of transportation, or any part thereof, and to utilize the same, to the exclusion as far as may be necessary of all other traffic thereon, for the transfer or transportation of troops, war material and equipment, or for such other purposes connected with the emergency as may be needful or desirable.

(b) The proclamation of the President taking over the steam railroads, dated Dec. 26, 1917, provides:

> Nothing herein shall be construed as now affecting the possession, operation and control of street electric passenger railways, including railways commonly called interurbans, whether such railways be or be not owned or controlled by such railroad companies or systems. By subsequent order and proclamation, if and when it shall be found necessary or desirable, possession, control or operation may be taken of all or any part of such street railway systems, including subways and tunnels.

(c) An act to provide for the operation of transportation systems under federal control, with just compensation to the owners, etc., approved March 21, 1917.

(d) Army appropriation act, approved Aug. 24, 1917, creating the Council of National Defense.

(e) Proclamation of the President establishing the War Industries Board, dated May 29, 1918.

(f) An act to authorize the President to provide housing for war needs, approved May 16, 1918:

> The President, for the purposes of providing housing, local transportation and other general community utilities for such industrial workers are as engaged in arsenals and navy yards of the United States and in industries connected with and essential to the national defense, and their families, * * * is hereby authorized and empowered, within the limits of the amounts herein authorized:
>
> To purchase, acquire by lease, construct, requisition, or acquire by condemnation or by gift such houses, buildings, furnishings, improvements, local transportation and other general community utilities and parts thereof as he may determine to be necessary for the proper conduct of the existing war.
>
> To aid in providing, equipping, managing, and maintaining houses, buildings, improvements, local transportation and other general community utilities by loan or otherwise to such person or persons and upon such terms and conditions as he may determine; provided, that no loan shall be made at less rate of interest than 5 per cent per annum, and such loan shall be properly secured by lien, mortgage, or otherwise.

(g) An act making appropriations to supply urgent deficiences in appropriations for the military and naval establishments on account of war expenses for the fiscal year ended June 30, 1917, and for other purposes, approved June 15, 1917, empowers the President:

> To requisition and take over for use or operation by the United States any plant, or any part thereof without taking possession of the entire plant, whether the United States has or has not any contract or agreement with the owner or occupier of such plant.
>
> The word "plant" shall include any factory, workshop, warehouse, engine works; buildings used for manufacture, assembling, construction, or any process; any shipyard or dockyard and discharging terminal or other facilities connected therewith.

(h) This act was subsequently amended to give the President specific power to take over electric railways, as follows:

> To take possession of, lease or assume control of any street railroad, interurban railroad, or part thereof, wherever operated, and all cars, appurtenances and franchises, or parts thereof, commonly used in connection with the operation thereof, necessary for the transfer and transportation of employees of shipyards or plants engaged or that may hereafter be engaged in the construction of ships or equipment therefor for the United States.
>
> The President may exercise the power and authority hereby granted through such departments of the government and through such agency or agencies as he shall determine from time to time.

(i) The act commonly known as the "Overman Act" confers power upon the President to make such re-distribution of functions among executive agencies as he may deem necessary whenever any functions, duties and powers hitherto by law conferred upon any executive department, bureau, agency, officer or agencies in his judgment shall seem best fitted to carry out the purposes of this act.

4. Thus Congress has conferred upon the President full and complete power and authority to assume control of the electric railways of this country. The greater power includes the less. The power to assume control may be entire control or a limited control, and if for the purpose of

(Continued on page 1243)

Increased Revenue to Offset Higher Wages

Power of the Federal Government to Raise Rates Considered —Other Action Possible

BY THOMAS N. MCCARTER
Chairman American Electric Railway War Board

I ADDRESS this board not in behalf of any particular electric railway company nor in reference to any case pending before the board. I speak as chairman of the War Board of the American Electric Railway Association, representing the entire industry. The purpose of the War Labor Board, as is evidenced by its name and by the proclamation of the President of the United States creating it, is to devise for the period of the war a method of labor adjustment. It is created to fulfill a war function. A very considerable number of cases affecting the wage scale of important electric railway systems throughout the country are already listed for determination before the board, and more will follow. In approaching the consideration of the problems involved, it is of the utmost consequence that the board should be fully cognizant of existing conditions affecting the electric railway industry, as follows:

1. The electric railways of the country are an indisputable and essential part of the nation's war machine. Their ability, generally speaking, not only to continue effective operation but to meet the increased demands put upon them by the location and development of war industries, is a war essential and has been clearly recognized as such by the administration, as appears from a citation from the last report of the Comptroller of the Currency and the correspondence between the Secretary of the Treasury and the President of the United States relating to the matter. The citation from the report of the Comptroller of the Currency is as follows:

> National and state banks, and many thousands of small and large investors, have suffered seriously from the decline of the earning capacity of public utility corporations and the consequent shrinkage in the value of their securities, representing investments of many hundred millions of dollars. These losses naturally diminish the power and disposition of the public to respond to the calls of the government for money for war. This danger should arouse, I venture to suggest, the anxiety and stimulate the efforts of the Congress and of every patriotic citizen. A more urgent and pressing peril is forced upon our attention by the obvious fact that we are dependent so largely on the efficiency and strength of these corporations and on our railroads for speed and success in preparing for and prosecuting the war.
>
> The corporations referred to supply light, heat, power and electric railway transportation for passengers and freight. They touch intimately the daily life of the people. In normal times they have been favorite targets for sneers and savage criticisms from large parts of the public and the press. In some instances, doubtless, they have deserved and invited hostility. In others, the attacks upon them probably have been unjust and unreasonable. Frequently they have been the victims of beneficiaries of local politics, suffering injury in the end in either case. Yet, generally, they were able to serve the needs of their communities with reasonable efficiency, and to earn fair returns on the money invested in them. Now they are threatened with ruin. If they are allowed to sink into inefficiency, much of the most important war work of the government will be crippled or paralyzed.
>
> The work of the war has thrown upon many of these corporations strains which they are unable to endure without prompt help. The costs of their labor and of all material for operation, betterment and upkeep have increased heavily and suddenly. They are required to increase radically and quickly their service and facilities. Industries manufacturing war munitions and materials demand of the public utility corporations constantly greater supplies of power and light. At the industrial centers, car lines are being rushed and overburdened by new armies of workers. The gas companies are called upon for gas for cooking and heating in quantities beyond all normal calculations, and far beyond their present capacity. They are urged continually to furnish more coke and coal by-products, toluol, and other elements absolutely essential in modern warfare. Where cantonments have been established the demands on the resources of water, lighting, and transportation companies are especially severe; ability to comply with such demands is necessary for the safety and comfort of the fighting men in training.
>
> The continued and increasing efficiency of these corporations is important for the successful conduct of the war. This efficiency is not possible with present conditions. Corporations proved by their own figures to be approaching bankruptcy cannot obtain money for improvements or maintenance. On the other hand, banks and citizens suffering severe losses from investments, in the securities of these entirely legitimate and once promising enterprises, will be discouraged from lending money to the government or deprived of the means to lend.
>
> The first and most important relief to the public utilities corporations can be given by the state public utilities commissions and municipal and local authorities with the broad-minded co-operation of the people generally, understanding the necessities of war and realizing that the more promptly its burdens are accepted, the sooner they will be lifted. It is essential that forbearance and consideration be exercised by State commissions and municipal authorities, and that the corporations also be permitted to make such additions to their charges for service as will keep in them the breath of solvency, protect their owners against unjust loss, and give them a basis of credit on which they may obtain the funds with which to meet the strains put on them by the government's needs. The breaking down of these corporations would be a national calamity.
>
> Because of the gravity of the situation in this regard, I am moved to ask for it the careful attention of the Congress and the public.

The Federal Reserve Board and the board of directors of the War Finance Corporation have each taken a similar position. The underlying thought is that the pre-war financial status quo of these companies must be preserved intact during the period of the war, in order that they may efficiently meet the burdens cast upon them by the war.

INCREASED RATES NECESSARY

2. It is a matter of common knowledge that the electric railways of the country, none too prosperous before the war, have been placed in a condition of dire necessity by the increased costs of operation arising out of the war and already existing. This condition of affairs and the resultant necessity for increased revenues to these companies was clearly recognized in the administration documents above referred to. These companies are at the present time very generally making strenuous efforts to secure increased rates with which to meet existing conditions.

HIGHER WAGES CAN BE PAID ONLY FROM LARGER REVENUES

3. Recognizing the higher costs of living, most of the companies of the country have already put into effect one or more wage raises to their trainmen. In my judgment, many of the companies have already fully met the just demands of the times, and they have all gone the limit based on their present revenues. Dissatisfaction, however, among the trainmen seems to be quite widespread, strikes have been threatened,, and many appeals have been made to this board. In order to preserve their efficiency as war factors, the companies are readily submitting themselves to the jurisdiction of this board. The total labor costs of the electric railways of the country approximate 60 per cent of all their operating expenses, as shown by the census of 1912. Under circumstances that I have shown to exist in this industry, I do not

assume that this board contemplates any ruthless increase in wages, especially in cases where the companies have already made raises commensurate with the increased costs of living. To the extent, however, that the burdens of these companies are increased by the decision of this board, the pre-war financial status and the efficiency of these companies as war factors are correspondingly impaired, unless such results are simultaneously accompanied by a compensating increase in revenue to the companies affected. In other words, where increased wage scales are ordered by this board the very results sought to be avoided by the President, the Secretary of the Treasury, the Comptroller of the Currency, and the government boards above referred to, will be brought about, unless compensatory increases are allowed.

FEDERAL CONTROL OVER RATES

4. How can these increases be assured? It may very well be that in war-time, under the Constitution and existing legislation, there is lodged in the President, acting through appropriate channels, power to raise rates in an amount equal to wage increases imposed by this board, or, if such power does not exist under present legislation, that it is within the power of Congress to enact it. If so, it should be done. Nor does it follow that it would be necessary for the government, in exercising this power, further to burden itself by taking over the operation and management of these properties, as it was compelled to do in the case of the steam roads. But, if the exercise of such power by the government is not legal or practicable, it is certain that this board should not make any substantial award of increased wages tending to bring about the result that I have indicated, without doing all that it can do to secure for the company affected a corresponding increase in revenue. The least that it can do, in my judgment, is to certify to the State Commission or local authority having rate-regulatory power over the particular company whose wage scale is affected by the order of the board, the exact amount of money involved in the increase of wages ordered, with a statement that the same has been ordered by the board as an element of war efficiency, accompanied by a recommendation on the part of the board that the regulating body forthwith secure to the company affected, in such manner as it thinks proper, a compensating increase in revenue. Such a recommendation would be quite in keeping with the spirit of that clause of President Wilson's letter to the Secretary of the Treasury in which he says:

> I shall be glad to have you communicate with the local authorities whenever the information in your possession suggests that such a course is desirable and in the national interests.

Such a recommendation, it is believed, would be fully respected by the various regulating bodies and carried into effect. It will only be by the adoption of one or the other of the methods above outlined that the pre-war financial status and war-time operating efficiency of the electric railways of the country can be preserved, as the government has undertaken to preserve the status of the steam railroads by following large increases in wages with an enormous increase in rates.

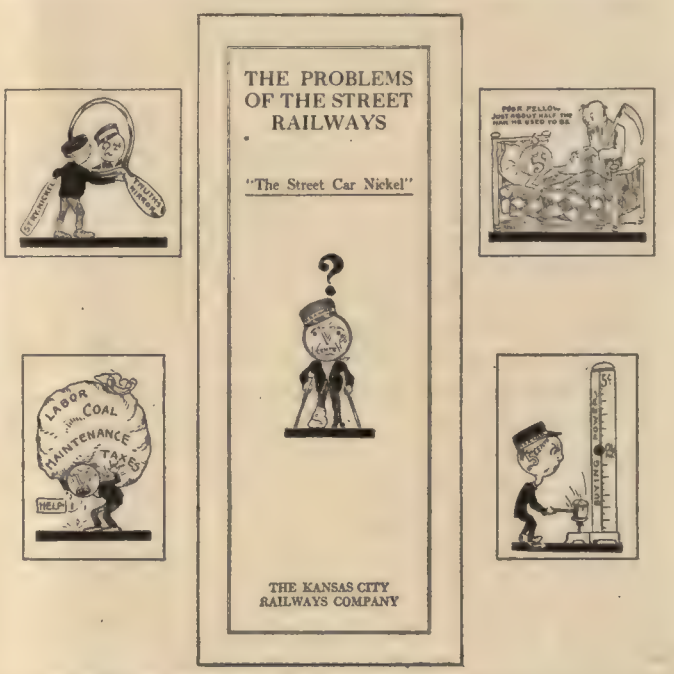
The Street Car Nickel

To Some People It May Look Big for a Ride, But to Railways It Looks Small for Coal, Labor and Other Necessities

TWENTY nickels may still be required to make $1, but there is a great difference between a nickel and the "street car nickel." Such is the lesson brought home to the public by the clever sixteen-page pamphlet being distributed by Kansas City (Mo.) Railways.

The booklet explains how the public now enjoys better cars, faster trips, smoother track, universal transfers, longer rides, more efficient service, heated cars and more lines. The company, however, has to meet constantly increasing expenses with the nickel now worth 2½ cents. The public does not appreciate what it gets for a nickel, or what the company has to do with a nickel.

It is pointed out that the problem is everybody's, and its solution is vital to every citizen of the community.



FRONT COVER OF PAMPHLET ISSUED BY KANSAS CITY RAILWAYS, ALSO CARTOONS USED TO ILLUSTRATE ITS PAGES

Moreover, the point is emphasized that the situation is the result of conditions, not management. The government recognizes the disastrous effects of attempting to furnish service at less than cost, and it has urged that state and local bodies give immediate relief to utilities.

The extended work which the company has done in connection with its present fare case is well shown in a thirty-two-page booklet containing facsimile reproductions of newspaper advertisements issued since the early part of March. The advertisements emphasize the point that "the price of service must meet its cost."

The company has also published in pamphlet form editorial comments from local newspapers concerning the proposed revenue increase. All recognize the fundamental principle that the price of service must meet its cost. The pamphlet also contains extracts of decisions by commissions in other states and the text of the utility-relief resolution recently adopted by the National Chamber of Commerce.

Power Generation and Transmission Progress

American Institute of Electrical Engineers Held Its Annual Convention at Atlantic City This Week With a Program of Valuable Papers on Lightning Protection, Power Production and Distribution, and Related Subjects

AS THIS issue of the ELECTRIC RAILWAY JOURNAL goes to press the American Institute of Electrical Engineers is in session in its annual convention at Atlantic City. The headquarters of the meeting were at the Marlborough-Blenheim Hotel and the meeting covered the period from June 26 to June 28, inclusive.

At Wednesday's sessions the retiring president, E. W. Rice, Jr., president of the General Electric Company, delivered his presidential address, and the president-elect, Prof. C. A. Adams of Harvard University, was introduced. Reports of technical committees were received and a conference of Institute officers and delegates of sections and branches was held. Technical papers were delivered at the Wednesday afternoon and Thursday morning sessions, and others were scheduled for Friday morning and afternoon. During the convention there were conferences of various kinds and a simple entertainment program was provided.

Following are abstracts of some of the Wednesday and Thursday papers. Others of interest to electric railway men, together with an epitome of the discussion, will be given in a later issue.

Split-Conductor and Aerial Cable in Power Distribution

Papers by W. H. Cole and E. B. Meyer Bring Out Some of the Characteristics of the Newer Designs in High-Voltage Cables

ONE of the newer developments in underground power distribution, covered in a paper by W. H. Cole of the Edison Electric Illuminating Company, Boston, Mass., is the use of the split-conductor cable for the purpose of insuring continuity of service. In connection with this Mr. Cole discussed various methods and protective schemes in use for disconnecting faulty lines.

The Edison Company has in use a total of about 142 miles of this cable, the earliest installation having been about five years ago. The preferred form of cable is the so-called "concentric twin" type, in which one conductor forms a core surrounded by a thin layer of insulation on which the second conductor is laid. A three-phase cable consists of three such split conductors, each surrounded by a heavier layer of insulation, with the whole incased in the usual over-all layer of insulating material and sheathed in lead.

Another paper in the field of cable practice was one by E. B. Meyer, Public Service Electric Company, Newark, N. J. Mr. Meyer's topic was the use of aerial cable in power transmission and the paper was along the same lines as the report of the committee on underground distribution presented by Mr. Meyer before the N. E. L. A. last week and abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for June 22, page 1182. On account of war conditions the Public Service Electric Company has considered it desirable to use aerial cables, which have been found able to withstand the heat of the summer sun without deterioration. The company uses paper-insulated cable with reinforced rubber jackets. Cross-sections of such cable are found in an accompanying illustration.

The cable is supported from a stranded steel messenger wire by means of metal rings, the messenger being clamped to the poles by means of a special braced suspension clamp.



CROSS-SECTIONS OF REINFORCED RUBBER MULTI-CONDUCTOR CABLE, WITH AND WITHOUT LEAD SHEATHING

The company has in service about 12 miles of cable operating at 13,200 volts and about 3 miles in operation or under construction for 26,400-volt service.

Doctor Steinmetz on "America's Power Supply"

Electrical Collection of Power and Distribution and Use of Induction Generator as Auxiliary to Synchronous Generator Advocated to Reduce Waste

ESPECIALLY appropriate at this time of fuel shortage was a paper by Dr. Charles P. Steinmetz on the subject of power resources in this country. He took up in particular the possibility of utilizing small water powers and of producing electrical power as a by-product in heating plants. In discussing the energy resources of the United States, Dr. Steinmetz endeavored to answer the questions which arose in his mind and which would naturally arise in the mind of any engineer or manager who is looking at the matter of power production in a large way. These questions relate to the possible sources of power supply, the means to be utilized in developing these more fully and the possibility of eliminating a part of the present energy waste. He considered as the sources of energy the coal reserve (including oil and gas), the water power, and that portion of the sun's heat which reaches the earth's surface.

1,000,000,000 TONS OF COAL IN 1920

Taking up first the coal production of the country and its equivalent in electrical power, Dr. Steinmetz quoted data to show that since 1870 the coal production has increased annually on an average 6½ per cent, which

would bring the total for 1920 to 1,000,000,000 tons. Estimating the chemical energy of a ton of coal to be equivalent to approximately one kw.-year (continuous or twenty-four hour service) the present annual consumption of coal represents in energy about 867,000,000 kw.-years. At a conversion efficiency of 10 per cent this would mean a continuous production of about 87,000,000 kilowatts.

One possible source of coal saving would be in utilizing in the form of electrical energy a part of the output of boilers used for heating purposes. By passing the steam from these boilers through steam turbines, for example, it would be possible to extract a certain amount of "high-grade" energy from the steam, and it would be necessary only to generate an additional amount of steam proportional to the efficiency of the turbine. For example, assume that 200,000,000 tons of coal is burned for heating purposes and that the steam which it produces is passed through turbine generators with an efficiency of 10 per cent. Then it would be necessary only to burn 20,000,000 tons more in order to produce 20,000,000 kw. continuously.

Even if the total efficiency of conversion from chemical energy to electric power were only 3 per cent it would be possible for a ton of coal to produce 250 kw.-hr. as a by-product in this way and, at a bulk value of ½ cent per kilowatt-hour, this would represent a power recovery value of $1.25 per ton of coal.

OUR POTENTIAL WATER POWER IS NOT LIMITLESS

Taking up the possible energy supply from water power, Dr. Steinmetz estimated that a continuous production of 230,000,000 kw. is the maximum possible hydroelectric power which could be produced in this country if every river, stream, brook or little creek throughout its entire length, during all seasons and including all water of the freshets, were used and could be used. Obviously we could never hope to develop more than a part of this power. It is startling to note, however, that this power production is only a little more than the total now produced from coal and is about equal to the present total energy consumption of the country. Thus while hydraulic energy may and should supplement that of coal, it can never entirely replace coal as a source of energy. This is probably the strongest argument for efforts to increase the efficiency of our methods of using coal.

13,000,000,000 KW. FROM THE SUN

The third possible available source of energy discussed by Dr. Steinmetz, very briefly, was solar radiation.

The solar radiation at the earth's surface is estimated at 1.4 calories per square centimeter per minute. Assuming 50 per cent of cloudiness there would be delivered on the surface in North America, between 30 and 50 deg. of latitude, a total of 800,000,000,000 kw. This is 1000 times as much as the total chemical energy of coal consumption, and 800 times as much as the potential energy of the total rainfall.

If only one-tenth of the solar radiation could be realized it would produce 13,000,000,000 kw. continuously on that portion of the earth's surface unsuited for agriculture. Here then would be the great source of energy for the future.

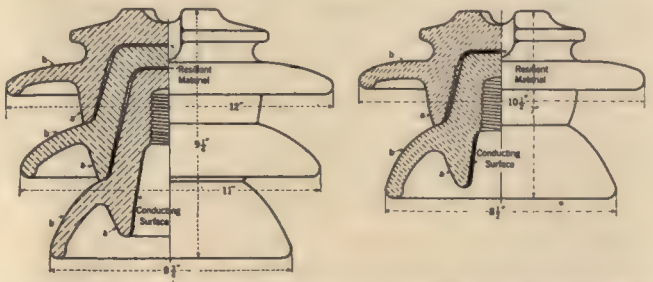
It would obviously be impossible to collect electrical power from small sources by means of the usual type of power plant. For collecting purposes Dr. Steinmetz suggests the use of induction generators driven by water or steam turbines. These machines would be operated without governors and with a minimum of auxiliary apparatus. The governing would be done from central synchronous plants. Automatic control could be used in order to insure perfect functioning of the small plants with the general system.

The induction generator, which is simply the induction motor driven above synchronous speed, is well suited to the above purpose in that its exciting current is drawn from the synchronous plant and its control is extremely simple.

Applying Theory and Practice to the Design of Transmission Line Insulators

A New Design is Proposed Which, in the Opinion of the Designer, Eliminates Some of the Faults of Earlier Designs

IN A rather elaborate paper on the subject of line insulators, G. I. Gilchrest, Westinghouse Electric & Manufacturing Company, listed some of the defects of existing insulators and proposed a new type as depicted in the drawings below. His paper contained results of



THREE-PIECE AND TWO-PIECE PIN-TYPE INSULATORS OF THE DESIGN PROPOSED BY MR. GILCHREST

numerous tests set forth in tabular and graphical form, and his main line of thought was as follows:

Owing to the rapid progress of transmission engineering the older designs of insulators are not altogether satisfactory. Some of the main causes of pin-type insulator failures have been: Improper distribution of dielectric field; improper distribution of surface leakage; porosity; mechanical breakage (from handling, mischievous shooting and stone throwing; insufficient strength of the supports, and brittle material); lightning; birds and animals short-circuiting lines; unequal expansion of metal, cement and porcelain; internal stresses in material, and defective batches.

The proposed designs embody these features (see figures): Surfaces *a* conform to the flow lines of the electrostatic field; surfaces *b* of the rain sheds conform to the equipotential surfaces; lines of mechanical stress are parallel to the electrostatic flow lines; the leakage resistance per shell is about uniform, being increased gradually from the head to the center shell; there is approximately uniform capacity per shell.

In designing these insulators the purpose has been to insure that the shortest air path under electrostatic stress shall be at least long enough to prevent overstressing of the air at any point. Further, the surface

resistance of the proposed design is gradually increased from the top to the center shells, the increase being considered as an advantage since the center shell will usually become dirtiest. With regard to porosity, the thicker portions of the porcelain in the cemented area should minimize the number of the pieces that will give trouble later in service. Mechanically the proposed design should be substantial due to the increase of thickness of the rain sheds and the addition of a drip edge.

Among other advantages of the proposed design is the low impulse ratio, *i.e.*, the ratio of the impulse break-down voltage to the continuously applied break-down voltage. Again, the body of the porcelain bounded by the flow lines *a* should have an impulse ratio close to unity. A very high impulse voltage might puncture the rain sheds, leaving this body of the unit intact.

Mechanically the introduction of a resilient material between tops of shells should eliminate the tendency of certain older designs to split off. Greater radii of curvature at the tops of insulator shells and a cement section sloped from the axis should tend to eliminate the trouble from any difference of coefficient of expansion of the porcelain and the cement. Furthermore, internal stresses set up in the insulator parts during manufacture should be very much decreased by the elimination of small radii in corners and sudden changes of cross-section of the material.

War Board Activities Discussed at Illinois Meeting

Work Has Included Consideration of War Finance Act, Rates, Wages, Fuel Conservation and Handling of Troops—Election of Officers

THE Illinois Electric Railway Association held its annual meeting on June 20. Members and delegates met at the Missouri Athletic Association, St. Louis, Mo., at 8.30 a.m. and enjoyed an excellent breakfast arranged for by D. E. Parsons, general manager East St. Louis & Suburban Railway. Following the breakfast and still under the direction of Mr. Parsons the members of the party boarded a special car on the East St. Louis & Suburban Railway and were carried across into Illinois to the St. Claire Country Club, where the meeting came to order at 11.30 a.m. with J. P. Blackhall, chairman of the executive committee of the association, presiding.

Following the regular business of the association—rollcall, reading of the minutes and reports of committees—the meeting was addressed by Britton I. Budd, president of the Chicago Elevated Railways and member of the American Electric Railway War Board. Mr. Budd spoke at length of the War Board, outlining the necessity that had arisen for this branch of the American Electric Railway Association and explaining how it had been organized. The first step taken by the board was in connection with the war finance act to enable the electric railways to obtain sufficient relief to guarantee necessary operation. The War Finance Corporation, as noted in the ELECTRIC RAILWAY JOURNAL for June 8, has since made the statement that the scope of its work did not include the making of direct loans to the electric railways, but that these must be obtained through the banks. Recent meetings with the corporation have been held by the War Board with the result that it may be necessary to amend the war finance act to cover such loans, for, as Mr. Budd says, "It is absolutely necessary for some arrangement to be made whereby electric railways can obtain direct assistance."

In the matter of rates the War Board has conferred with the railroad administration on the subject of passenger rates. With the Fuel Administration it has also made a study of the skip stop with the result that this service is being put into effect all over the country as a measure for the conservation of fuel. The board is in close touch with the new War Labor Board which has been established, and is consulted with regard to any question concerning the electric railways which comes before the government. In fact, the board enjoys the absolute confidence of all branches and departments of the federal government. Mr. Budd also described the purposes of the meetings of the War Labor Board on June 24, at which it would be represented by its chairman, Mr. McCarter.

An item of importance to the interurban roads, said Mr. Budd, is the fact that the railroad administration has decided to route all drafted men over the electric roads wherever possible. All roads have been requested to make up schedules and file them with the administration, and they will be notified of troop movements as on the steam roads. The same holds true with the land movement of naval men. The agitation of the Hearst newspapers of Chicago for free transportation of men in uniform is not practical, and contradictory to state and federal legislation. The executive committee was requested to appoint someone to take charge of placing the various schedules in the hands of Provost Marshal General Crowder.

Mr. Budd said: "The position of the electric railways and their ability to serve has been greatly improved, and they occupy to-day a more important place than ever before. The work of the American Electric Railway Association and its War Board is vital to the industry at this time of so many momentous questions. The association and the board should have the hearty support of every railway company."

OFFICERS ELECTED

The new officers elected for the ensuing year are: President, D. E. Parsons, general manager East St. Louis & Suburban Railway; vice-president, F. J. Baker, president Bloomington, Pontiac & Joliet Railway; secretary-treasurer, W. C. Sparks, general manager Rockford and Interurban Railway; executive committee—C. F. Handshy, assistant general manager Illinois Traction System, chairman; H. E. Chubbuck, vice-president executive Illinois Traction System; Britton I. Budd, president Chicago Elevated Railways; E. C. Faber, general manager Aurora, Elgin & Chicago Railroad; F. E. Fisher, general superintendent Chicago, Ottawa & Peoria Railway; E. M. Walker, general manager Terre Haute Traction & Light Company.

Following a short address by the president-elect, in which he outlined the importance of the work before the association for the coming year, a luncheon was served at 2.30 o'clock and the facilities of the club were thrown open to the members of the association. The afternoon was spent on the golf links by the majority of the members.

Bluff Point Meeting Well Attended

The Economic Situation Was Considered in Several Papers and Reviewed by Speakers in the Discussion—Publicity as a Solution Recommended by Ivy L. Lee and B. A. Hegeman, Jr.—Association Pledges Its Support to the Government

IN VIEW of the financial condition and outlook of the electric railway industry, the New York Electric Railway Association at its thirty-sixth annual meeting, held at Bluff Point on June 22, dispensed with technical papers and discussed instead the financial needs of the properties and the proper methods of securing relief. The tenor of the whole discussion was that the companies should take up with courage, frankness and faith the momentous work of educating the public in regard to the need of higher revenues to provide adequate wages to employees and adequate service to the public—all to the end that the carriers might be enabled fully to perform their essential services in this hour of national need.

Telegram Sent by the New York State Association to President Wilson

Bluff Point, N. Y., June 22, 1918.

To the President of the United States,
Washington, D. C.

The New York Electric Railway Association in convention here, keenly realizes that good electric railway service is essential to the war program of the national government.

By resolution, we pledge to you and to the government our best endeavor to maintain these utilities at the highest degree of efficiency.

Our combined mental, physical and electrical strength is enlisted in the Government's service.

New York Electric Railway Association,
H. B. WEATHERWAX, *President.*

REMARKS BY PRESIDENT FISK

The meeting, which was attended by about 125 delegates, was presided over by the president, Wilbur C. Fisk, president Hudson & Manhattan Railroad. In his opening speech President Fisk related how the meeting last year had been held in a brief and formal manner on account of the declaration of war and how during the year the work of most of the committees had of necessity been practically suspended. The year, however, had been very eventful for the railways, and the executive committee had decided that it was essential to meet and discuss the situation. President Fisk said that one question was of fundamental importance—the need of income sufficiently great not to hamper the companies in their efforts to co-operate with the government. Progress toward securing more nearly adequate revenues has been made but the work which has been accomplished is only the beginning of what must be done.

William F. Stanton, secretary-treasurer of the association, reported that the work of the special committee of ten appointed to consider ways and means of securing additional revenues had been untiring, and that a great deal had also been accomplished by the committees representing the association in connection with the pending revision of accounting classifications by the Public Service Commission for the Second District. Mr. Stanton reported the addition of four new members of the association, the membership now including thirty-four active, eighty-seven allied and eight associate members. The secretary reported that the association now included all of the larger electric railway companies in the State and that the membership committee hoped eventually to bring all the remaining companies into the association.

The cash balance on hand on July 1, 1917, together with receipts during the year, totaled $9,855.72, with disbursements of $3,243.39, leaving a balance of $6,612.33, of which $3,000 was invested in Liberty Bonds.

LOCAL ASPECTS OF FARE SITUATION

The only formal address of the meeting, presented by Thomas Conway, Jr., professor of finance, University of Pennsylvania, was a comprehensive review of the movement for higher fares in the State of New York. This address is published in abstract on another page. Following this the subject was held open for discussion, and the first two speakers described the local aspects of the fare situation in Rochester and other northern cities and in New York City.

J. F. Hamilton, vice-president New York State Railways, Rochester, N. Y., said that after the famous Rochester decision of the Court of Appeals, holding that the commission now has not the power to alter franchise rates, the company applied for relief to the municipal authorities in Utica, Syracuse and Rochester. After conferences an agreement was reached in Utica and Syracuse whereby the cities were to engage accountants to go over the company's books and make a report to the Public Service Commission, and the resulting recommendations then made by the commission would be accepted by the cities. It happens that there are no franchise fare restrictions in Syracuse. Some exist in the case of Utica, but this municipality has passed an ordinance waiving the restrictions during the period of the war.

The situation was more difficult in Rochester, Mr. Hamilton explained, inasmuch as the authorities there had been fighting a rate increase through the courts.

An understanding has been reached, however, in accordance with which the city will employ accountants to report to the law committee of the Common Council. The company has been assured by the municipal administration that this body will then render fair and just treatment. Mr. Hamilton added, however, that owing to a recent wage increase the position of the company will not be much improved by the grant of a 6-cent fare, as compared to the improvement if the higher fare had been granted, earlier, for now most of the fare gain will be absorbed by the wage increase.

F. T. Wood, assistant to vice-president and general manager New York Railways, described in the main the hearty and straight-forward co-operation displayed by his company's employees in the movement for higher fares. It will be recalled that two years ago the employees formed a local organization called the Brotherhood of New York Railways' Employees. The company has been absolutely frank with this organization; it has opened up the financial books and has shown the employees that its earning power is so low as now to approach very close to the danger line. The men realize that the company is doing all that it can for them and on their own initiative they have offered to help as much as possible.

A committee from the brotherhood of its own volition called upon city officials and explained the company's need for increased revenues. In line with a policy of complete publicity, they then published the substance of the conference in the employees' magazine. They also produced, for distribution on the cars, a circular calling the public's attention to the opportunities of more remunerative employment in other fields, to the need of efficient utility operation and to the impossibility of the company's paying living wages and remaining solvent without a fare increase. Furthermore, the men explained that unless a fare increase is granted they will have to seek employment elsewhere when their individual contracts expire at the end of the summer. Many passengers wrote on the circulars distributed a personal indorsement of the men's position and returned them to the conductors.

The viewpoint of the manufacturers on the subject of the need of higher fares was then presented by B. A. Hegeman, Jr., in a paper of which an abstract appears in another column.

The Public Must Be Trusted

Called upon to express the opinion of the publicity man, Ivy L. Lee stated that things are now in the air the outcome of which cannot be guessed a week ahead, but that utilities must have faith in the ultimate fairness of the public. In general he believed that it is absolutely necessary to get down to fundamentals—to reconsider all attitudes toward labor, commissions and the public.

For instance, now is a time when labor should be taken completely into the confidence of the railways. The companies should join with labor before the public, for they are in no position to resist the demands of employees for a living wage. A frank statement to the public that the labor charge constitutes the first lien on the utility revenues would gain the confidence of the community more readily than any other means.

As for co-operation with the commissions, the companies should seek to remove the present defects in the regulatory system in New York State. The companies must secure for the commissions complete power and then have confidence that this power will be exercised only in a helpful manner.

In a time such as at present, Mr. Lee averred, only one attitude will appeal to the public, and this is that the real and sole aim of electric railways is to help in all possible ways to win the war. Consequently the companies must co-operate with the public in giving essential war service. This involves the placing of confidence in the fairness of the public. Without this there is little hope. Every utility must proceed upon the theory that the public, when once placed in possession of the facts, will be not only fair but even generous.

Mr. Lee said that he had been impressed with the lack of imagination and courage displayed by the steam railroad executives in dealing with the public. Time and time again, if these officials had gone before the public with the whole story, they would have received support. In the case of the eight-hour law, meaning a wage increase to only 25 per cent of their employees, the companies might well have said to the public that the other 75 per cent were not included in the plan proposed, that this large body of employees should also be relieved and that the compensation paid to the companies should be adjusted simultaneously. With such a program of justice thoroughly and frankly explained, the public would have acted fairly.

The only reason, Mr. Lee stated, why Director-General McAdoo has succeeded in establishing such extraordinary increases in wages and rates for the steam lines is because the public believes in the government. The main work now for electric railway operators is to lay their case before the public with such courage, frankness and palpable sincerity that the public will have the same faith in them as in public officials.

The only way to get permanently out of the slough of despond, Mr. Lee concluded, is to make the public see that the companies desire to co-operate with the men through the payment of living wages, with the public through the maintenance of proper service and with the nation through giving all possible aid in the prosecution of the war.

President Fisk stated that he agreed with Mr. Lee and that the sentiments expressed formed his exact platform. From the applause he judged that the same thing could be said of the association.

Fare Question Should Be Scientifically Studied

Joseph K. Choate, vice-president J. G. White Management Corporation, concluded the discussion of the financial situation. He said that what it had been possible to do during the last year had been accomplished through the backing of the association, and that the work of the committee of ten had been spread over the whole United States. Indeed, about 20 per cent of the money subscribed had been spent in furnishing information to the industry outside of New York State.

The committee is to meet soon to carry on its activities, and it will devote much attention to publicity work. Moreover, in Mr. Choate's opinion, a scientific study should now be undertaken in regard to electric railway

rates. The companies failed to provide for such an investigation once before, but they misunderstood the situation.

Now, said Mr. Choate, the peculiar condition existing is this: Expenses are so rapidly rising that a 6-cent fare is almost certain to prove inadequate in furnishing the revenues needed. A 10-cent fare may be necessary, but will this encourage highway-building and a wider use of jitneys and automobiles? In other words, is there a fare point beyond which the electric railway industry cannot afford to go? In Mr. Choate's opinion, funds should be raised for a thorough investigation of the rate question. It is necessary work, and the time is opportune.

The nominating committee then reported the following names for the ensuing year: President, H. B. Weatherwax, vice-president United Traction Company, Albany; first vice-president, E. A. Maher, Jr., vice-president and general manager Third Avenue Railway, New York; second vice-president, T. C. Cherry, vice-president Rochester & Syracuse Railroad, Inc., Rochester; secretary-treasurer, William F. Stanton, assistant to president New York State Railways (Rochester Lines). The nominees for the new executive committee were the following: W. O. Wood, president and general manager New York and Queens County Railway, Long Island City; J. E. Hewes, vice-president and general manager Albany Southern Railroad, Albany, and W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company. The nominees were all unanimously elected. Mr. Weatherwax was then escorted to the chair, and after remarks, which are published elsewhere, he declared the meeting adjourned.

Banquet Addresses Emphasize Patriotic Aims

President Fisk presided at the banquet in the evening, and before introducing the speakers presented the resolutions prepared by the committee appointed for that service, with Charles C. Castle as chairman, at the morning session. The first resolution pledged the members of the association to maintain their utilities in as efficient a condition as possible and placed their strength at the services of the government. This resolution was embodied in a telegram sent by President-elect Weatherwax to President Wilson and is reproduced at the beginning of this article. The second resolution was in memory of Captain Bullock, formerly of the Brooklyn Rapid Transit Company and always an active member of the association, who recently met his death at the front in France. This resolution, which was adopted by a rising vote, follows:

Whereas, This association has learned with deepest sorrow and regret of the death, in the service of his country, of Captain Harry A. Bullock, Secretary of the New York Municipal Railway Corporation, and

Whereas, Captain Bullock was known to us as a railway man of ability, initiative and intelligence, and as a citizen, whose patriotism was well reflected in his instant response to the call of the Nation in its hour of need, be it

Resolved, that the New York Electric Railway Association assembled in annual convention hereby expresses its appreciation of the services rendered to the industry by Captain Bullock and of that devotion to duty which caused him to lay down his life in the Nation's cause and that it expresses by this resolution its heartfelt sorrow at his untimely end, and be it further

Resolved, that the secretary be instructed to spread this resolution on the minutes of this meeting and forward a copy thereof to Captain Bullock's family.

The two speakers of the evening were Hon. William H. Edwards, collector of internal revenue of New York, and Ivy L. Lee. Mr. Edwards, who was a famous football player at Princeton during his college days, laid emphasis on the necessity for team work in this country among all classes to win the war. He quoted the recent letters of President Wilson and other prominent officials in Washington on the importance of trolley service to the national efficiency, and urged more intensive work on the part of all in the United States to support our men at the front and defeat the enemy.

Mr. Lee prefaced his remarks with the statement that he was pleased to hear the resolutions presented in regard to Captain Bullock because they had been reporters together on the New York Times sixteen years ago. He paid a high tribute to the character and attainments of the former Brooklyn official. He then gave a very interesting account of conditions at the front in Belgium, France and Italy where he had recently been in the interests of the Red Cross. During this trip he had found hard at work at a hospital close to the battle line Dr. J. J. Moorehead, formerly chief surgeon Interborough Rapid Transit Company, but now enlisted as a war surgeon. Mr. Lee then described the work of the Red Cross among the refuges from the territories overrun by the enemy and the stimulating effect of its ministrations upon the populations and military forces of our allies.

Higher Fares Essential

The One-Fourth of Our National Wealth Subject to Regulation Is Suffering and Needs Relief

BY H. B. WEATHERWAX
Vice-President United Traction Company, Albany, N. Y.

ACCORDING to the census, the total wealth in the United States in 1912 was $188,000,000,000. This may be divided into that part subject to regulation and that not subject to regulation. The first part aggregates $26,000,000,000, of which $5,000,000,000 represents the electric railways, the balance being the investment in steam railroads, telegraphs, telephones, Pullman and private cars, shipping and canals, water works, privately owned, and light and power plants privately owned. The wealth not subject to regulation in the census classification amounts to $162,000,000,000 and represents real estate, personal effects, manufacturing plants and their products, mining plants and their products, live stock, etc. This accumulation of $188,000,000,000 represents the savings of the entire 400 years of settlement in this country.

There is no official statement of the annual income, but estimates have been made by several authorities. From them it may be inferred that the total value of the national product and of all productive service in 1912 was in excess of $35,000,000,000. It is startling to reflect that the accumulations of four centuries are no more than the income of five years of our present time, and reflection gives ample warning of the dangers inherent in income and inheritance taxes that strike directly to the productive capital fund.

Roughly the investment of potential capital (or wealth productively employed) divides into three principal groups, namely, (a) agricultural production, (b) manufacturing and mining, and (c) steam and elec-

tric railways, light, power and gas companies, etc., regulated by an ever increasing mass of legislation, federal and state. At a time when capital invested in groups (a) and (b) is profitable to an unusual and amazing degree, capital invested in group (c) is embarrassed and so generally threatened with destruction as to show this condition is not the accident of corporate management, character of the service or geographical location. We must look for an explanation to the difference in circumstances, to the regulation of statute and commissions. For more than a generation these public utilities have been the subject of public attack and have been on the defensive. It is the legislature and the commissions upon whom the responsibility seems to rest and to whom we must look for a speedy solution of our problems unless we are to be involved in disaster.

The electric railways have been in private hands, except in a very few cases, since their construction began about thirty years ago. At this moment the physical condition of these properties is better than at any time in their history and there is no occasion for anxiety regarding their equipment or ways and structures for many months. The matter for anxiety and anxiety of the gravest character is the supply of labor, the freedom of management, the maintenance of working capital and the integrity of credit.

One of the companies which I represent has increased the wages of its platform men 95 per cent in eighteen years, 70 per cent in ten years and twenty-five per cent in the last six months, other employees having been increased in proportion. The cost of materials and supplies has increased even more rapidly. During the same period the price of what we have to sell has remained stationary or reduced by regulatory bodies. At the present time the investor in electric railway securities is confronted with a picture of the National government fixing the price of coke at an advance of 216 per cent; of wheat at an advance of 156 per cent; bituminous coal at an advance of 115 per cent; of pig iron at an advance of 105 per cent; of freight rates of the railroad, through the Interstate Commerce Commission, under private ownership, covering nearly a period of thirty years' operation at an advance of 4 per cent, and under Federal control for a six months' period of advancing rates about 45 per cent. No wonder he hesitates or declines absolutely to invest in our business.

THE SITUATION IN NEW YORK STATE PARTICULARLY URGENT

The courts in this State, as you know, have decided that the Public Service Commission has no jurisdiction to increase the rate of fare fixed by contract between the municipalities and the carriers. This should not be so and this association must make strenuous efforts to have the legislature at the coming session remedy by the proper legislation this very perplexing situation. During the last few days of the legislative session a bill known as the "Pratt bill" was introduced which was thought would remedy the situation, but it was defeated. An effort should be made at the next session to have a similar bill passed. The only other remedy for increasing fares where franchise limitations obtain is to get the City Council to permit the increase. Something along this line has been accomplished, but usually it is for the period of the War only, and when the War ends utter confusion will result unless some legislation is obtained that will remedy the situation for all time.

The Status of the Higher Fare

A Review of the Movement to Secure Higher Electric Fares in the State of New York.

BY THOMAS CONWAY, JR., PH.D.
Professor of Finance, University of Pennsylvania

IT IS NOW fifteen months since the members of the New York Electric Railway Association took limited action to secure a living rate of fare, thereby inaugurating a great movement which has swept over the entire country and has won the endorsement of the President of the United States, the Secretary of the Treasury, the Comptroller of the Currency, and practically all of the Public Service Commissions. To Joseph K. Choate, chairman of your committee on ways and means to obtain additional revenue, falls the honor of being the first man in the public utility field to foresee the situation in which the utilities now find themselves, and to propose remedial measures. Early in January, 1917, Mr. Choate, wrote to Lucius S. Storrs, then president of the American Electric Railway Association, calling attention to the serious tendencies which were manifesting themselves with respect to the operations of electric railways, and suggesting that steps be taken by the national organization to secure relief. Owing to a combination of circumstances, it was impossible to secure definite action along the lines of Mr. Choate's proposal at the mid-winter meeting of the Association, held in February, 1917. The situation daily grew worse, and in April, 1917, Mr. Choate suggested to James P. Barnes, then president of your organization, that this association should take definite steps to secure financial relief through higher fares. This was, I believe, the inception of the movement with which everyone in the industry is now familiar.

It has been my privilege to be closely associated with a number of rate cases in other jurisdictions. I know it to be a fact that the testimony produced by your "committee of ten" concerning the financial condition of electric railways, the increased cost of operation, the cessation of new construction, and the need for relief, has been introduced into evidence before numerous other commissions and is to-day the most complete and authoritative statement in existence of the problem of the electric railways. The advice of the members of your committee of ten, and particularly of its distinguished chairman, has been sought by electric railways throughout the entire country.

In this state, as you know, thirty-six companies made application to the two public service commissions for permission to raise rates. During the late summer and fall of 1917, cases were pushed to trial as rapidly as possible, consistent with the other work of the commissions. All told, twelve decisions have been rendered. In every instance where the facts have been adjudicated the Public Service Commission has formally found that the companies were entitled to additional revenues.

The electric railways of this state have presented their cases frankly and fully. They have asked only for

the opportunity to earn a fair return upon the fair value of their property and they have not proved the fair value of their property. They have not asked for dividends on overcapitalization, but have fully met the standards which are set up in the public service commissions law and the decisions of the courts of this state. So far as the equities are concerned, they have clearly established their right to larger revenues.

While the companies have won every case upon the facts, they have not been so fortunate with reference to the law. Late in 1917, the city of Rochester made application for a writ of prohibition against the Public Service Commission to restrain that body from considering upon its merits the application of the New York State Railways Company for permission to increase its rate of fare in the city of Rochester to 6 cents. The Appellate Division denied the application, whereupon an appeal was taken to the Court of Appeals, which, on April 5, 1918, held that the Public Service Commission was without jurisdiction to raise street railway fares above the figure named in the franchise, and issued a writ of prohibition restraining the commission from hearing the application of the company. I have talked to a number of lawyers of long experience and high standing and have yet to find one who fully understands the lengthy opinion of the Court of Appeals and can tell exactly where the court stands. With all respect to the court, this opinion is one of the finest examples of judicial camouflage which can be found in the law books. Of one thing alone are we certain. As the public service law now stands, the commission is without power to advance rates beyond the amount specified in the franchise. No one can be certain, from reading the opinion, whether an amendment to the law would give the commission this power or whether there is some insuperable barrier which makes it impossible for the legislature to confer this power upon the commission. The companies must, therefore, wait for the legislature to convene again and at that time endeavor to secure an amendment to the public service law, giving to the commission power to raise rates when it finds, after considering all of the facts, that the companies are entitled to a higher rate of fare. When and if this law is passed, there will inevitably follow a judicial test as to its constitutionality, and then the Court of Appeals will presumably rule as to whether the legislature can delegate to the commission the power to grant relief to the utilities. At best, almost two years must elapse before the legal question will be definitely settled.

Immediately following the decision of the Court of Appeals, the several companies which had petitioned for increases in fares requested the municipalities which they served to amend their franchises by striking out the stipulation of a maximum fare of 5 cents, conferring upon the Public Service Commission the right to fix, from time to time, just and reasonable rates of fare. Up to the present time, I believe, action has been secured from nine municipalities.

> **I am certain that, while much remains to be done and a difficult task is still ahead, we have passed through the worst of our struggle for justice. * * * We have awakened the public conscience. We have started a movement for a living rate of fare which has spread all over the country. We have broken the tradition in that a nickel and a carfare are synonymous, and these achievements are the controlling factors in the situation and will eventually bring success. The task of the moment is the work of public education. It has been our task from the first day of our campaign for higher fares.** DR. THOMAS CONWAY, JR.

WHAT HAS BEEN DONE IN DIFFERENT CITIES

Six-cent fares are already in effect in the villages of Waverly and Ossining, where the award of the Public Service Commission was overthrown by the Rochester decision and where the local authorities have waived their rights to a 5-cent fare under the franchises of the local companies. A 6-cent fare is in effect in the city of White Plains, to be continued until the first of August, in the expectation that the Public Service Commission for the Second District will, in the meantime, fix a fare sufficiently high to permit the rendering of proper service. This is the result of an agreement with the Common Council. The city of Syracuse has withdrawn its opposition to a 6-cent fare and has consented to abide by the decision of the Public Service Commission as to its necessity. There were no franchise restrictions in Syracuse.

The city of Kingston has amended the franchise of the Kingston Consolidated Railroad, so as to remove the restrictions as to the rate of fare, which is to be left to the decision of the Public Service Commission.

The cities of Utica, Troy, Watervliet and the villages of Green Island, Tarrytown, Scarsdale and Harrison have, by proper action of the local authorities, agreed to leave to the Public Service Commission the question as to whether a 6-cent fare shall be collected. An examination of the books of the New York State Railways, operating in the city of Rochester, is being made by accountants representing the city and the company, with the understanding that if the finances of the company show the necessity, a 6-cent fare shall be permitted to be collected.

In the city of Buffalo, accountants appointed by the Common Council are examining the books of the company for the purpose of determining whether the collection of a 6-cent fare is necessary.

The Public Service Commission for the Second District has, in the case of the Ogdensburgh Street Railway (whose franchises contain no restrictions as to rate of fare), permitted the collection of a 7-cent fare, and that rate is now in effect.

The Public Service Commission has also granted a 6 cent fare to the Poughkeepsie City & Wappinger Falls Railway.

I understand that the matter of amending the franchises is under consideration in a number of other cities. The progress of securing amendments to franchises, conferring upon the commission the right to fix just and reasonable rates is very encouraging, and there is good reason to hope and expect that other cities in the state will confer upon the Public Service Commission similar authority.

It is unfortunately true, however, that in a few cases the appeals of the railway companies have not been re-

ceived in the broad-minded fashion in which they should have been considered. When the companies have gone to some of the municipalities armed with facts and figures to show their dire necessities and have asked to have their franchises amended so that the Public Service Commission might fix just and reasonable rates, and when these companies have pointed out that the failure to make these modifications in franchises would lead to receiverships, the municipal officials have said in substance: "Well, what of it? We don't care whether you go into a receivership or not. As a matter of fact, we would like to have you go into a receivership. You fellows have been robbing us for years, and now, when the wheel has turned, we shall have our innings. We will give you no relief, and we hope that you get so poor that you will be forced into bankruptcy." Where this position is not a cheap Bolshevik play to the galleries, it is the result of a complete misunderstanding of the facts. There are doubtless honest and well meaning municipal officials who share the rather widespread belief that the street railway business has been tremendously profitable. The average man, riding upon a trolley car, sees perhaps fifty people, all of whom have paid a nickel or more, and figures out that most of the money goes to the stockholders. He has no comprehension whatever of the cost of operating a road. The idea that street railways have been tremendously profitable has been fostered in the public mind by the lurid stories appearing in muck-raking magazines concerning high finance operations in one or two cities through the multiplication of capitalization in mergers and consolidations. The street railway, therefore, to a considerable group of people, symbolizes a financial engine of extortion through which the public is robbed. The difficulty is that these people are mentally living in a past generation. Their ideas are thirty or forty years old. They fail to distinguish between a few financial buccaneers who, years ago, exploited a few properties, making money out of selling securities rather than operating the railway, and the great mass of electric railways. These people totally misunderstand the position which your companies have taken and which electric railways the country over are taking in asking for higher rates. They forget, or never heard, that all you are asking for is a fair return upon the fair value of your property.

It seems to me, beyond question, that favorable action by those municipalities which have amended their franchises has been secured because of two reasons—in the first place, the educational work which your committee of ten and the individual companies have done to acquaint the people of New York State with the condition of the electric railways as a whole and the several companies individually. In the second place, I am certain that the fair-minded portion of the public has been impressed with the justice of the railways' claims by the decisions of the Public Service Commission, holding that the companies were entitled to higher fares, rendered prior to the pronouncement of the Court of Appeals.

Even where some doubt exists in the minds of municipal officials or the public, it seems to me that the fairness of the companies' contention that no injustice can be done to the people in any city by passing the franchise amendment requested is self-evident to all. The amendment does not, *ipso facto*, authorize the company to charge higher fares. It merely permits the Public Service Commission, after a full inquiry, to fix a just and reasonable rate, that is to say, one which is high enough to yield what the courts of the state and of the United States have held to be a fair return upon the investment and not so high as to constitute an unjust burden upon the public. When the franchise amendment is secured, the companies must then prove to the commission that they are entitled to a higher fare, showing the value of their property and all of the facts concerning their operations—especially what they have earned and what it has cost them to render the transportation service.

What will the cities gain by strangling their public utilities? Of what advantage is it to them to make capital reluctant to enter an industry outrageously mistreated, leading to higher rates of interest and a consequent increase in the cost of service? All of these questions lie at the very heart of the present situation. It is the duty of every electric railway man to see that each is fully and frankly discussed in the public press and wherever it is possible to direct public attention to them. In this way, and in this way alone, in my opinion, can a permanent solution of present difficulties be achieved.
DR. THOMAS CONWAY, JR.

It is to the lasting discredit of a few municipalities that they have either ignored the request of their local street railways for an amendment to the franchise or have allowed months to elapse without taking action upon such requests where the facts could not be a matter of dispute because they had already been determined by the commission. A typical case is found in the failure on the part of the city of New York to render justice to the New York & North Shore Traction Company. This company has been subject to the jurisdiction of the New York Public Service Commission, First District, throughout its existence. This commission granted to the company certificates of public convenience and necessity; the line was built under the general supervision of the commission, which carefully checked and audited the cost of construction and fixed the capitalization of the company. Its operation, since construction was finished, has been under the continuous supervision and scrutiny of the commission. Surely, we have there no possibility of a dispute as to the facts.

In its recent decision, upon the application of the company for permission to institute 7-cent fares, the commission had formally found that the company has never earned a fair return upon the value of its property; that the return in the fiscal year ended June 30, 1917, equaled 2.44 per cent upon the cost of the enterprise, as originally approved by the commission; that, because of insufficient earnings, over 35.82 per cent of the original investment has been lost, due to insufficient maintenance and consequent accrued depreciation, and that even the fare of 7 cents, which the company desired, was in no way sufficient to yield a fair return. The commission, however, held that it did not have the legal right to authorize the increase in rates, but recommended to the city of New York that the franchise of the company be amended by striking out several absurd provisions with

reference to the amortization of the original cost of the property (doubtless written into the franchise by a former chief of the bureau of franchises of the commission) and that the provision concerning a 5 cent maximum fare be stricken out, the right to fix rates of fare being conferred upon the commission. This decision was rendered on January 7, 1918. Has the city of New York recognized its clear duty and granted to this ill-starred enterprise the relief which is indisputably necessary? We all know nothing has been done.

The explanation for the failure to render justice to those companies about which there was no possibility of doubt concerning the equity of their claim for higher fares is twofold. In the first place, municipal officials, as a rule, have political aspirations. They desire to succeed themselves in their present posts or aspire to more lucrative offices. Some of them, lacking courage and foresight, feel that to increase rates will be unpopular, and will therefore cost them votes. Whatever may be their private opinions, these chicken-hearted officials feel that the utility has no right to ask them to impair their political prospects in order that justice may be done. These officials, moreover, feel that the street railway will struggle through somehow. Stockholders may have to go without dividends; maintenance may be neglected; no new cars may be purchased; bankruptcy may even occur. No matter what happens can be turned to their advantage. If service deteriorates, they can gain popularity by appearing to champion the rights of the people through vigorously protesting against the inadequacy of the service. If additional facilities are not provided, they can seek refuge through vilification of the corporation or blame the condition upon the war. If the corporation is forced into bankruptcy, they can prate of overcapitalization, and dilate upon the alleged advantages to the people and to the municipality of a receivership and a reorganization. Anything that happens, they figure, adds to their political capital.

The second reason for the unwillingness of a certain group of public officials to act promptly and courageously in doing justice to the electric railways is the desire of some of them to hasten the day of municipal ownership of such utilities. Without going into the motives which inspire these officials to champion municipal ownership, the fact remains that many of them see, in the present crisis, an opportunity to hasten the accomplishment of this end. The failure to give deserved relief to the street railway companies will doubtless bring the owners of these properties to the point where they will be the chief advocates of municipal ownership. Thus, the municipal ownership advocate argues, the best way to accomplish his purpose is to refrain from giving relief to the street railways.

STEAM RAILROAD PARALLEL CITED

A parallel for the position in which the electric railways find themselves is found in the recent experience of our steam railroads. Some years ago, when operating costs began to rise, the railroads applied to the Interstate Commerce Commission for relief through higher fares. Their necessities were fully and exhaustively presented. Various organizations of shippers, actuated by the selfish desire to pay as little as possible for carrying freight, opposed the petitions for higher rates. The representatives of one or two state commissions joined in the movement. Instead of the matter being decided calmly and judicially upon its merits, it became a national political issue. The members of the Interstate Commerce Commission failed in their duty. Again and again relief was either denied or given only in small measure. The consequences of this short-sighted action are now plainly evident. Unable to make a favorable financial showing, the railroads could not procure additional capital. New construction practically ceased. Additional rolling stock could only be secured by a few roads, and then only in insufficient quantities. The business of the country was expanding at a tremendous pace, while our transportation system was stationary. And then war suddenly came to us. Unable to handle normal business, our transportation system, which had been allowed to atrophy, completely broke down. National disaster stared us in the face, and the only recourse was for the Government to take over the roads, to guarantee a reasonable return to investors, and to provide the capital necessary to make up the short-sighted mistakes in the past.

What has occurred since we entered the war? The Interstate Commerce Commission, last spring, granted a 15 per cent increase in freight rates and numerous advances in passenger fares. Now that the needs of the railroads are judged upon a business basis, the Director General of Railroads has put into effect a further increase of 25 per cent in the freight rates and of from 10 to 33 per cent in passenger rates. We have heard little recently from the self-appointed champions of the people who formerly filled the newspapers with specious combinations of figures designed to show that the railroads needed no additional revenues.

It requires no prophet to say to you that officials of a few municipalities are riding for the same fall as did the Interstate Commerce Commission. He who is blind today to the needs of the utilities is directly opposing the efforts of the nation to win the war. I wish it were possible definitely to fasten upon every municipal official who refuses to grant relief to an electric railway the stigma that he is hindering the Government in its gigantic task. From this conclusion there can be no escape. The welfare of the utilities is a matter of great public consequence. The higher officials of our government, including the Comptroller of the Currency, the Secretary of the Treasury and the President himself, have spoken plainly and unequivocally. By doing so, they have greatly simplified the problem of securing relief for the public utilities.

THE DUTY AHEAD

In spite of the discouraging decision of the Court of Appeals and the uncertainties as to the ability of the Legislature of New York to confer upon the commission the power to advance rates, I feel optimistic concerning the outlook. I am certain that, while much remains to be done and a difficult task is still ahead, we have passed through the worst of our struggle for justice. The example of the municipalities which have conferred upon the commission power to fix just and reasonable rates increases the likelihood that the other municipalities will be equally fair and just. We have awakened the public conscience. We have started a movement for a living rate of fare which has spread all over the country. We have broken the tradition that a nickel and a carfare

are synonymous, and these achievements are the controlling factors in the situation and will eventually bring success. The task of the moment is the work of public education. It has been our task from the first day of our campaign for higher fares. In spite of the discouraging experience which has befallen some of us, I think we are all still confident of the fair-mindedness of the American public, once it is made to see its duty. If we do not have this confidence, it must inevitably follow that we despair of this great experiment in democracy which we are now trying to extend by force over a larger portion of the earth.

It is a difficult task to capture and hold public attention in these days filled with tremendous events, but the very difficulty of this task should stir us to greater efforts and more effective work. While endeavoring to secure modifications of franchises, I believe this association should, at the same time, continue its campaign of education designed to create public sentiment in favor of a legislative amendment to the Public Service Law, giving to the duly constituted, properly equipped administrative body, especially created by the state for the regulation and control of public utilities, the power of fixing just and reasonable rates, irrespective of agreements as regards rates entered into years ago under totally different circumstances and conditions between the early pioneers in the electric railway field and the municipalities. If the charges of the utilities can be reduced by the commissions, why should they not be increased, after the facts have been determined? What is more absurd than to give to the commission the right to regulate standards of service and, at the same time, deprive them of the ability to give to the railway an earning power sufficient to furnish the service which the commission has ordered?

Crisis of Situation Approaching

What will the cities gain by strangling their public utilities? Of what advantage is it to them to make capital reluctant to enter an industry outrageously mistreated, leading to higher rates of interest and a consequent increase in the cost of service? All of these questions lie at the very heart of the present situation. It is the duty of every electric railway man to see that each is fully and frankly discussed in the public press and wherever it is possible to direct public attention to them. In this way, and in this way alone, in my opinion, can a permanent solution of the present difficulties be achieved. With tremendous increases in the cost of operation occurring almost hourly; with wages mounting to heights far beyond the financial ability of the utilities to reach and with operating problems more difficult than have ever been faced in the past, the situation is indeed discouraging, but let every man who must face these tasks comfort himself and rekindle his hope by remembering that, if I may borrow the phrase, we are approaching the very "peak and crisis" of the situation, and that if we can succeed in lodging the power to establish just and reasonable rates with the commission, we will have established the electric railway industry upon a sound financial basis; we will have made it a business into which not only capital but brains will continue to embark, and in which men will feel amply repaid for spending their lives in endeavoring, to the best of their abilities, to serve the public.

More Publicity Needed

Railways Should Explain Their Problems to the Public—Manufacturers Are Ready to Help in Any Way

By B. A. Hegeman, Jr.
President National Railway Appliance Company, New York

PUBLIC UTILITIES are the only industry that is required by law to sell its wares at a "before the war" price, notwithstanding the admitted fact that they are struggling valiently to keep their heads above water under this ruinous condition, but with the extraordinary cost of material and labor, they will surely "go under" unless some relief in the nature of increased revenue through fare increases is not forthcoming in the immediate future. You will no doubt ask—have we not done everything possible, with everybody possible, and in every way possible, to lay our troubles before those interested? In the main, you have, but there is still more that you can do and that in one word, is *advertising*. I am, and have always been, a great believer in advertising and if you will look at the wonderful results that have been achieved within the last year by following out the idea of an intensive advertising campaign, I think you will agree with me.

Liberty Bonds Sold by Advertising

Since the United States entered the war a little more than a year ago, about $10,000,000,000 has been placed at the disposal of the government. How? By advertising. There have been three Liberty loans, and now we are getting ready for the fourth. On the occasion of the first loan, our country asked for $2,000,000,000 and it received $3,035,226,850. The number of subscribers to that loan totaled more than 4,000,000 people. On the occasion of the second loan, $3,000,000,000 was asked for and $4,617,532,000 was received. The number of people subscribing to this loan totaled 9,500,000. When the third Liberty loan came around, $3,000,000,000 was again asked for and $4,170,019,650 was received from 17,000,000 subscribers. In each case the government got more than $1,000,000,000 in excess of what it asked for. How? By advertising. Look at the last Red Cross drive: A hundred million was asked for and $160,000,000 was received. How? By advertising. Look at all the other various relief associations, the Y. M. C. A., the Knights of Columbus, the Salvation Army and a host of others which made drives, all, without exception, receiving considerably more than they asked for originally to carry through their projects. And how? Again I say, by advertising.

The American public does not object to paying if properly approached, for the people know what they want, want what they want and get what they want and they don't care, in a good many cases, how much they pay for it, but they do object to paying when the idea is tucked away back in their heads that the other fellow is getting the big end of the deal. The 5-cent piece for a car ride is almost as sacred to them as the American flag. To a good many of them it is more familiar. Unfortunately, their whole knowledge of the subject, as Dr. Conway so forcibly points out, has been along lines not conducive to a healthy state of mind. They have been led to believe that the railway business was tremendously profitable, and until comparatively recent times no one has attempted to change this opinion.

Why is this so? The average man hasn't been educated up to the facts. His ideas on the actual cost of railway operation are very hazy. Then there are the yellow sheets that pass for newspapers, with their stories of high finance, graft and other toothsome morsels that comprise the only means of education about the railways that ever reaches that man. Is it any wonder that the average man thinks that an unjust burden is being put upon him when he is asked to pay an extra cent for a car ride and that it is up to him to fight, in his own small way, all he knows how to avoid paying the extra cent. If the people who are dependent upon the electric railways for their transportation facilities, only knew just how much the thousand and one things entering into the construction, maintenance and operation of a railroad had advanced in cost during the past three or four years, they would be forced to realize that increased revenue must be provided or that they would be compelled to walk where they now comfortably ride. This information can be effectively brought to the attention of the public by a display in your cars of posters giving in the form of the deadly parallel the data referred to, the truth of which could not be denied.

I am told that in many cases where recently the railways have received the right to charge a 6-cent fare, the labor union has immediately demanded an increased wage. This fact the public should also know. Keep them posted and thereby command their support.

What have the railways done to correct these conditions? How many have conducted active and constant publicity campaigns? Comparatively few. There has been a spurt here and there, but it soon died out and things are as they used to be before.

You have a commodity to sell which is absolutely essential, but because it is absolutely essential is no reason why it should not be advertised. It is because it is needed every day in the year that it should be advertised every day in the year. Full and frank publicity between the railroad manager and his public are two things to be very much desired.

How to Reach the Public

This question of railway advertising is still in its infancy. The technical journals have done their share in a small way and the financial papers of standing have also done theirs, but the technical papers and magazines and the financial journals do not reach the majority of the public, and as a result comparatively few of the people whom you are trying to reach know the actual conditions as they exist to-day. Therefore, it is up to you to educate them. And how are you going to do that? Again, I answer, by advertising. Advertise to-day; advertise to-morrow; advertise every week in the month and every month in the year. Lay your troubles honestly before your customers and show them how they ultimately will suffer unless they help.

Besides posters and advertising in newspapers and magazines, get your publicity man to write little stories of human interest along railroad lines for the newspapers and magazines. Publish a company magazine and tell your troubles to your employees and their families. Get up an attractive folder, distribute it to your passengers, place copies in hotel racks, in the schools, clubs, etc. See that the conventions that come to your city receive a supply. Tell your story all the time.

I often wonder if it ever occurs to any of us that thousands of the public are dependent on the prosperity of our public utilities for their material existence, either as stockholders in these companies, employees of the railways themselves or employees in the varied lines of business catering to the needs of these railway companies. Is it not reasonable to suppose that if the facts of the case were frankly stated to this portion of the public they might arrange the vote so as to inject a certain amount of rigidity into the wobbling spines of some of our public servants? I have always felt that a counter-attack might produce some good results. Quiet submissions don't get us very far removed from a receivership, and when that comes, who is blamed? Why not at least try and inform the stockholders. Let them know that they are partners in the business and must do their part? We manufacturers will tell our associates that it is up to them to help if three meals a day are to be expected. Am I wrong in feeling that much might be acccomplished if something along these lines were tried?

Ways in Which Manufacturers Can Help

I was asked to discuss Dr. Conway's paper from the manufacturers' standpoint, and while I have said a good deal that apparently has no relation to my subject, whatever makes for better conditions on the railroads, makes for the manufacturers' prosperity. We are truly interdependent. From the manufacturers' viewpoint the present situation is extremely serious. With conditions as they are, with little new equipment coming through, with repairs cut down to actual necessities, the manufacturer, so far as the electric railways are concerned, is doing little compared to three years ago and the situation is not looking very rosy for the future.

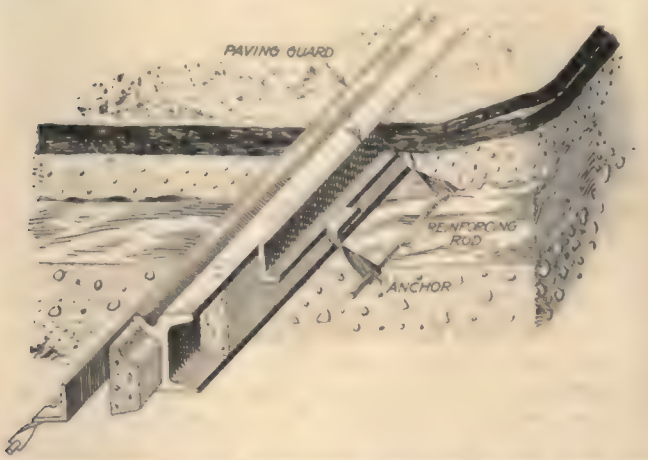
When I mentioned frankness between the railroad people and their public, I said nothing about the railroad managers in their dealings with the manufacturers, as I wanted to speak to you about that later on. This is a question of vital importance, especially in these trying times when billions are being discussed with the same calmness that we used to discuss hundreds and thousands. I am firmly of the opinion that the day is now here when this question of frankness between the railroad man and the manufacturer is a matter of fact, rather than fancy. Gentlemen, your problems are our problems. Why can't we get together and help each other? Much has been said in the past at meetings and conventions regarding this very subject, but too little has been actually done. We want to help you in your troubles but have not been accorded the opportunity. The fact remains, we are standing ready, are with you in spirit, awaiting a call to do something that will benefit you, and in benefiting you we ourselves will be benfited.

The Eastern lines of the Pennsylvania Railroad on June 5, 1918, had 7227 women in this employ. This is an increase of 1545 over the number on May 27. During the same ten days the number of male employees decreased by 900. The average labor turnover on the Pennsylvania lines, East, exclusive of the general office force, is at the rate of 100 per cent annually.

Preventing Disintegration of Paving Along the Rail Head

Newly Invented Angle-Iron Paving Edge Permits Motion of Rail Without Causing Damage to Paving

THE maintenance of paving along the rail head is a serious element in the operating cost of the way department on any electric railway property having track in paved streets. Vertical play of the rails together with the "punishment" which the paving gets

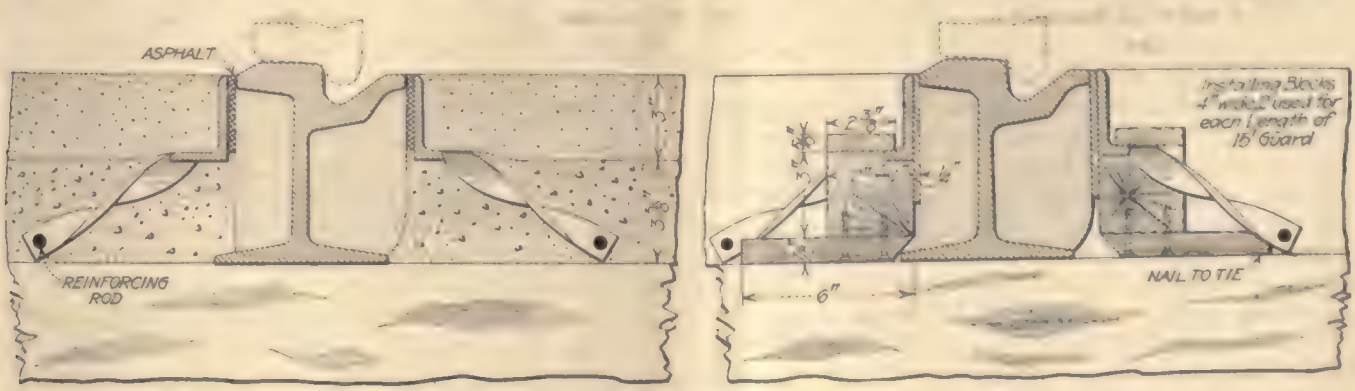


PROSPECTIVE VIEW OF PAVING GUARDS, WITH ANCHORS AND REINFORCING RODS

from heavy wagons and motor trucks combine to break away the paving where it comes in contact with the rail heads.

For the purposes of securing the ties, rails and fillers in a semi-rigid construction, free to vibrate without detriment to the adjoining paving, the International Steel Tie Company, Cleveland, Ohio, has placed on the market a line of guards, of angle iron, provided with substantial anchors. These are securely locked into the concrete paving foundation by means of twisted strips and anchor rods. The accompanying drawings clearly show the details of construction. The guard, of course, permits the use of any suitable foundation under the ties, such as broken stone, soil, etc.

The same plan is applicable to the edging of a permanent roadway, such as brick or asphalt on concrete foundation, preventing disintegration where this roadway joins the unpaved portion of the highway. A modification of the plan also permits the formation of a steel protected flangeway alongside of T-rails. In many cases the use of this scheme would undoubtedly overcome municipal objection to the use of T-rail in city streets.



CROSS SECTION 7-IN. GROOVED RAIL WITH 3-IN. PAVING GUARDS, AND OF SAME RAIL WITH GUARD IN PROCESS OF INSTALLATION

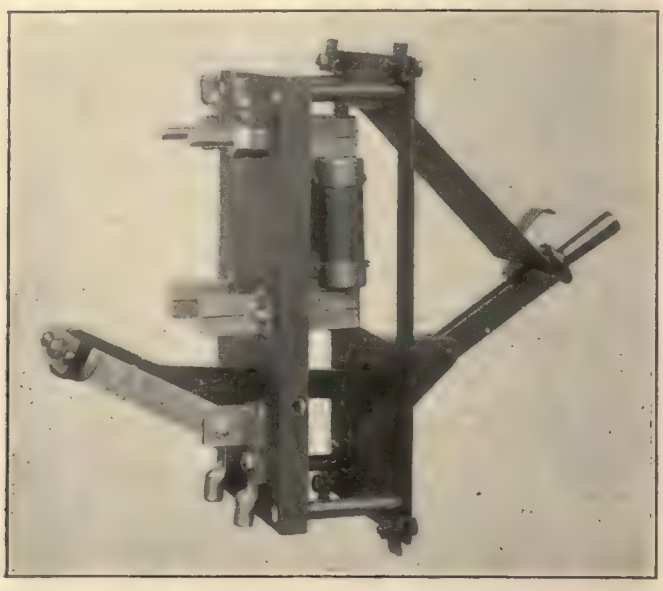
Low-Tension Dead-Front Switch Panel Provides Safety for Operators

A LINE of dead-front panel switches has been brought out by the General Electric Company, Schenectady, as a safety-first development. These are for use as distributing panels and for generators and feeder panels of power plants or shops and are somewhat similar in construction to the safety-first switchboard described in the ELECTRIC RAILWAY JOURNAL of Dec. 16, 1916, page 1260. The switches have a current rating range of from 60 to 600 amp.



FRONT OF A SAFETY-FIRST SWITCH PANEL

A switch unit consist of a standard knife switch with fuse clip parts mounted on a slate base and supported by iron ducts at the back of a sheet-steel panel. The operating handle is so arranged that it is in a vertical position when the switch is "on" and inclined at an angle of 60 deg. with the panel when the switch is in the "off" position. The operating link passes through both the steel panel and the slate base and transmits the motion from the handle to a lever attached to the cross-bar of the switch. The steel panel of the switch unit is provided with a sheet-steel door which is hinged at the top, allowing it to open upward as far as the stop on the operating handle behind which it is mounted. This door gives access to the fuses from the front of the panel but cannot be opened while the switch is "on," and when this door is open the switch



SAFETY SWITCH AND OPERATING MECHANISM

cannot be closed. This provides for the inspection and replacement of fuses and protects the operator from coming in contact with the live current-carrying parts, as the fuses are on the load side of the switch and the fuse clips must be dead before the fuse compartment door can be opened.

The panel frame is built of riveted angle iron and the current-carrying parts back of the panel are inclosed in expanded metal.

Spot-Welding for Brake Hangers

THE Portland Railway, Light & Power Company has worked out a plan for decreasing the cost of maintaining the half-ball brake hangers used on Brill-22 special trucks. Thus it has not only been possible to reduce the cost, but the uncertainties of delayed deliveries and the necessity for foreseeing requirements in placing advance orders have been eliminated.

When the trucks come in for the regular inspection after running 80,000 miles, a limit gage is applied to the brake hangers to determine whether their wear warrants replacement. Formerly worn hangers were scrapped, but now they are saved and sorted according to the extent of wear. In the case of a worn ball, a steel sleeve is spot-welded on, and in worn sockets, malleable-iron bushings are put in and spot-welded around the rim, thus bringing the hangers back to standard gage and providing uniform wearing surface.

The cost of repairing the brake hangers in this way has been less than the price of new hangers at the factory and it is believed that the repaired hangers give even longer wear than the new equipment. The repair costs, approximately, are 13 cents each for the steel sleeves or bushing, about 5 cents for boring or turning, and 5 cents each for spot-welding.

By adopting as standard several gage sizes for the ball and socket joint, it has been possible to extend the repair over several stages of wear. For example, the worn brake hangers are sorted according to extent of wear and repaired accordingly, to fit gage standards of 1⅞ in., 2 in., 2⅛ in. or 3-in. sizes.

The plan has been evolved by F. P. Maize, master mechanic for the company.

A Safety Siding That Saved Nine Lives

ON THE Lake Burien line of the Seattle Municipal Railway there is a 4.5 per cent grade just above a curve where the line passes around the brow of a hill. The curve has a radius of 180 ft. and a central angle of 55 deg., so that a runaway coming down the hill would probably leave the track on this curve. In fact, a truck which escaped from a work crew did run away down this grade and plunged over the bank at the curve.

To provide a safeguard at this point, a safety siding was constructed just above the curve, consisting of a 120-ft. length of track running up hill on a 15 per cent grade. The switch from the main line to this safety siding is always left open, necessitating cars coming to a full stop and the throwing of the switch lever by hand.

Not long after this safety siding was built, the motorman of a car containing eight passengers disobeyed a stop order at the top of the grade and lost control of the car when the trolley whipped off as they rounded the curve. The car continued on down the grade and by the time it reached the safety siding is estimated to have reached a speed of at least 60 m.p.h. Striking the switch, the car was safely shunted onto the siding and ran up the entire 120 ft. of 15 per cent grade before the momentum was overcome and the car came to a stop.

The only injuries were those sustained by the conductor when he leaped from the car soon after control was lost. The passengers all crouched on the floor of the car and as it did not tip over even when reaching the end of the siding, neither they nor the motorman were injured in any way.

Since this accident the rails on the upper part of the safety siding have been replaced by a coarse gravel trough with guard rails to prevent the trucks from leaving the graveled roadbed.

The safety siding was designed and built under the direction of the Department of Public Utilities of the City of Seattle.



SAFETY SIDING ON THE SEATTLE (WASH.) MUNICIPAL RAILWAY

Increase Rates to Permit Higher Wages

(Concluded from page 1226)

the war the only control that is necessary, as we contend, is to bring about increased revenue through an increased rate of fare, there is ample authority for the President to exercise control over electric railways to the extent only of regulating their rates of fare.

The purpose of all the above-mentioned legislation was to confer upon the President the authority to do whatever was necessary in the national defense as far as the transportation facilities of the country were concerned. If this purpose can be carried into effect by a control limited to the fixing of rates of fare, he undoubtedly under such legislation has such power. This is all that is necessary to meet the present emergency and put electric railways in condition to discharge efficiently their duties so essential to the nation's welfare at this time. The power may be exercised through such instrumentality as the President may designate.

Argument Impresses Labor Board Section

That the presiding members of the War Labor Board were impressed by the arguments in the brief was indicated by the immediate responses. Mr. Taft said: "This matter probably ought to come before the whole board, which meets tomorrow. On this brief, which is very complete, the points are established not only that Congress has the power, with respect to which we had a little doubt, but that under the language of these statutes the President has the power. Therefore, after a hearing of the case, should we regard it as necessary to invite the attention of the President to the necessity of raising rates in respect to electric railways, we would not hesitate to recommend it. That, of course, would involve the appointment of some kind of rate tribunal or agency to take up each case on its merits. This board would not attempt to recommend what the rates should be, or what in any particular case should be done."

Mr. Walsh said: "We are not asking for control except to get the additional revenues for increased cost of labor and materials. My suggestion would be that the President appoint an administrator—I believe in centralizing these powers in war times—to have jurisdiction over all transportation utilities of the country, to get the staff of experts necessary to find out the necessities of the situation and to keep his hand on this subject during the war."

At this point Mr. McCarter emphasized the fact that unless rates are raised in compensation for higher wages, the electric railway industry will be ruined. The employees should be treated fairly, of course, but if a very substantial increase is granted and the railways secure as aid only the good offices of the War Labor Board in urging fare increases, a serious panic will occur in the industry and the country at large. In other words, any delay in securing the fare relief will mean wide-spread disaster.

Argument Repeated Before Whole Board

On June 27 Director of Law Fitzgerald of Cleveland stated that he did not dissent from the proposition that either Congress or the President has power to relieve the electric railways in the present emergency, but that he questioned the present advisability of federal action. He admitted that the present maximum fare under the Tayler franchise in Cleveland is not enough to give the stipulated 6 per cent return to the stockholders, and that before the city and the company could settle the matter of a new fare scale a public referendum requiring from forty to sixty days might be required. He thought that if delay ensued and the interests of the nation became jeopardized, it would then be time to exercise the extraordinary power of intervention by the federal government.

Mr. Taft stated that the War Labor Board does not intend to recommend any particular form of action by the national government, but one would suppose that each fare case will have to stand on its own feet and the question of intervention in any particular city will be presented to the agency appointed. His questioning of Mr. Fitzgerald seemed to indicate a belief that if a federal agency were empowered to enter a local situation and grant appropriate relief for the duration of the war in case the city authorities refused to act promptly, this would not be inequitable.

William D. Mahon, president Amalgamated Association, then said that the men are not asking for any change in hours of labor for a day's work; they will continue to labor ten hours, even eleven, twelve or thirteen hours, in view of the present emergency, even while other industries are securing an eight-hour day. The men, however, must have a living wage, and they will leave for other industries if they do not receive it speedily. If this situation is not squarely met, the efficiency of the companies will be destroyed. As for Cleveland, the men there will not wait during the delay of a referendum or any such thing, and the union will not let one city hold up a national settlement. In short, he concluded, there must be no delay in meeting the wage situation. Mr. Squire also emphasized the need of prompt action in Cleveland and his lack of confidence that the city will grant speedy relief.

In view of the fundamental importance of the question of federal aid, Mr. Taft asked that the argument of the railways, which as before stated was concurred in by the union representatives, be repeated before the whole board, for he desired any recommendation made by Mr. Walsh and himself to meet with the approval of the board. Consequently the argument was repeated by Mr. Gadsden and Mr. McCarter in the presence of the two chairmen and eight out of the ten representatives of employers and labor. Decision in the matter was then reserved, and the hearings were ordered to be continued on June 28 for the further consideration of the living-wage question. It is expected that decisions on this question will be handed down within the next month.

71 Per Cent Wage Increase in Cleveland Too Much

The first evidence presented by the railways on the subject of a living wage was given by Mr. Squire, who said that the Cleveland Railway can find no excuse for the men demanding an advance to 60 cents an hour or an increase of 71 per cent at this time. In the last eight years the company has made five advances in wages by agreement with its men, and the wages in the last year were 40 per cent more than in 1910. Mr. Squire pointed out that motormen and conductors are not skilled employees, and the work is not difficult.

The wages in Cleveland from May 1, 1917, to May 1, 1918, were 32 cents an hour for the first year of service and 35 cents an hour thereafter, the average being sub-

WHAT AN INCREASE IN WAGES MEANS IN CLEVELAND

Increase in Cents per Hour	Total Average in Cents per Hour	Increase in Wages	Increase in Cents per Car-Mile	Total in Cents per Car-Mile
1	35	$77,000	0.2139	7.4888
2	36	154,000	0.4277	7.7026
3	37	231,000	0.6416	7.9165
4	38	308,000	0.8555	8.1304
5	39	385,000	1.0694	8.3443
6	40	462,000	1.2833	8.5582
7	41	539,000	1.4972	8.7721
8	42	616,000	1.7111	8.9860
9	43	693,000	1.9250	9.1999
10	44	770,000	2.1388	9.4137
11	45	847,000	2.3527	9.6276
12	46	924,000	2.5666	9.8415
13	47	1,001,000	2.7805	10.0554
14	48	1,078,000	2.9944	10.2693
15	49	1,155,000	3.2083	10.4832
16	50	1,232,000	3.4251	10.7000
17	51	1,309,000	3.6389	10.9138
18	52	1,386,000	3.8528	11.1277
19	53	1,463,000	4.0667	11.3416
20	54	1,540,000	4.2806	11.5555
21	55	1,617,000	4.4945	11.7694
22	56	1,694,000	4.7084	11.9833
23	57	1,771,000	4.9223	12.1972
24	58	1,848,000	5.1362	12.4111
25	69	1,925,000	5.3501	12.6250
26	60	2,002,000	5.5639	12 8388

stantially 34 cents an hour. The average amount per car mile was 7.2749 cents, the total wages for the year being $2,620,484. The effect of a wage increase at various rates is shown by the accompanying table, which was included in the company's brief. The present operating-expense allowance is 16 cents per car mile, of which more than 45 per cent goes to conductors and motormen. Wages at 60 cents an hour would take 80 per cent of the operating-expense allowance.

RAILWAY MEN PRESENT

The electric railway men present in Washington during the hearings—most of them having gone there to handle pending wage cases before the board—included the following:

Henry G. Bradlee, Boston; James P. Barnes, Schenectady; F. W. Brooks, Detroit; H. C. Clark, New York; Joseph S. Clark and C. M. Clark, Philadelphia.

A. L. Drum, Philadelphia; H. C. Donecker, Newark, N. J.; Edwin C. Faber, Washington; H. B. Flowers, Baltimore; P. H. Gadsden, Washington; W. W. Gurley, and A. L. Gardner, Chicago.

J. F. Hamilton, Rochester; Horace Lowry, Minneapolis; Thomas N. McCarter, Newark, N. J.; J. J. Stanley, Andrew Squire and H. J. Crawford, Cleveland; W. H. Sawyer, Columbus, Ohio.

C. L. S. Tingley, Philadelphia; Edmund W. Wakelee, Newark, N. J.; H. B. Weatherwax, Albany; Bernard F. Weadock, Detroit; F. H. McCulloch, Evanston, Ill.

M. C. B. and A. R. M. M. Associations Hold Special Meeting at Chicago

THE usual conventions of the Master Car Builders' and Master Mechanics' Associations were omitted this year but in their place was a joint meeting of representative members. This was held at Chicago on June 19 and 20. Its purpose was to accept reports of committees and transact necessary business. The attendance, including representatives of both associations, was about ninety. A large number of reports were presented in printed form and provision was made in the program for essential discussion.

The secretary's reports contained the following data regarding the associations. The M. C. B. Association now comprises 446 active members, 593 representative members, 14 associate members and 19 life members, a total of 1072. The A. R. M. M. Association membership in the several classes is: Active, 902; representative, 98; associate, 17; honorary, 45; total, 1062.

Wm. Schlafge resigned the presidency of the Master Mechanics' Association, and F. H. Clark, general superintendent of motive power B. & O. Railroad, was elected to the office. Changes were also made in the vice-presidencies of this association and one vice-presidential change was made in the Master Car Builders' Association.

AMERICAN ASSOCIATION NEWS

C. M. Mock Explains Consolidation Plan at Chicago

AT THE meeting of the Chicago Elevated Railroads company section held on May 21 C. M. Mock, chief engineer, read a comprehensive paper covering the tentative plans for the consolidation of the surface and elevated roads in Chicago. The remainder of the meeting was given over to patriotic matters, including a talk about the navy by Ensign E. W. Roemer and a report on the several Liberty Loans by N. W. V. Griffin.

Section No. 1 Stirred by Patriotic Addresses

THE evening of May 16 was "Patriotic Night" to the employees of the Milwaukee Electric Railway & Light Company. There was patriotic music followed by the entry of the color guard with the employees about to enter military service. Lieut. J. A. Crozier of the British-Canadian Recruiting Mission, and Dr. C. H. Beale, a local orator of note, were the principal speakers, their themes having to do with the war. Appropriate "movies" and songs rounded out the program.

"Human Frailty" Discussed at Manila

AT THE MEETING of joint company section No. 5 held at Manila on May 7, 1918, L. C. Bewsey, day carhouse foreman, department of shops and carhouses, Manila Electric Railroad & Light Corporation, read a paper on "The Human Element as Applied to Electric Railways." The paper stirred up quite a little discussion, a number of the speakers taking issue with Mr. Bewsey, considering him too severe on his fellow men. However, the general impression was that the paper was well worth while. The burden of the argument was that a great deal of the difficulty of operating an electric railway satisfactorily is due not so much to faults in equipment as to faults in the personality of the workers.

The speaker said that "we can be classed as dishonest if we are inefficient, or fail to give the public all of the comforts, convenience and courtesy to which it is entitled. In the operation of the electric railway we hear much said of mechanical and electrical failures, but seldom of man failures. For example, when a car is pulled into a carhouse with a broken trolley pole the failure is classed as mechanical; yet the pole would not have been broken if some man had not failed to make a perfect pole, or to install it properly, or to give it thorough inspection and care, or to operate his car carefully around a curve or under special overhead work, or to turn the pole when the car was backing up, or to keep the trolley wire in repair."

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Pittsburgh's New Revenue

Receivers Indicate Increase in Receipts Under New Fare Will Go Back into the Property.

A statement has been issued of the receivers outlining the channels into which the Pittsburgh (Pa.) Railways intends to divert the new revenues under the increased fares put into effect on June 20 as noted briefly on page 1254 in this issue of the ELECTRIC RAILWAY JOURNAL. This statement follows in part:

EXTRA WAGES $1,700,000

"Whatever the increased receipts may be, every cent will be consumed in paying increased wages and increased costs of material essential to the operation of the cars and to the maintenance of roadbed and rolling stock in the best possible condition. Increased wages alone will consume $1,700,000 of the expected additional revenue.

"It is the aim and intention of the receivers to keep the street railway property in good operating condition. Track and roadbed will be placed in the best possible condition as far as the revenue will allow and every available car will be prepared to meet unusual winter difficulties.

"The electric equipment of the cars was badly damaged last winter by continued storms and much trouble was due to inability to secure repair parts promptly, although ample provision in the way of reserve equipment had been made for a normal winter. Our superintendent of equipment has arranged to prevent all trouble that may possibly be foreseen and has perfected plans to reduce the possibility of large amounts of moisture and snow entering the motor casing, a prime source of trouble last winter. So far the reserve stocks of field coils have been increased from 102 to 766 and of armatures from 89 to more than 200, and it is expected that during the summer these reserve stocks will be largely augmented, with the result that it will be possible to make winter repairs more quickly than ever before. As an addition and unusual precaution all coils are being doubly impregnated with insulating compound to enable them better to withstand exceptional snows and thaws.

SHOPS FULLY MANNED

"At present all departments of the shops are fully manned and they are capable of carrying out the policy of placing the equipment in the best possible condition, although no assurance against a labor shortage later on is given by the war situation. Fifteen cars for interurban service and fifty double-truck steel trail cars for city service are being added to the equipment this year in addition to the number operated during 1917.

"The receivers intend to bring the roadbed to the highest possible standard.

"One of the contributing causes to unsatisfactory service last fall and winter was the dissatisfaction among some of the trainmen, who refused to work trippers and trailers and to perform their duties satisfactorily until a wage advance was given them prior to the termination of their agreement. Since the appointment of the receivers an additional advance in wages has been made, and disputes as to working conditions have been eliminated. Increased wages in the shops and substations has resulted in improved efficiency in these departments.

"Orders of the fuel administration to enforce the adoption of the skip-stop plan on practically all of our lines will result in an improvement of the service."

Additional Facts About East St. Louis Wages

On June 1 the E. W. Clark & Company Management Corporation properties in East St. Louis, known as the East St. Louis & Suburban Railway, East St. Louis Railway and Alton, Granite & St. Louis Traction Company, voluntarily increased wages 2 cents an hour, making 33 cents for city men and 35 cents for interurban men, although the companies had a contract with the motormen and conductors which did not expire until May 1, 1919.

The men seemed to be dissatisfied with this increase and the company frankly stated that it was willing to have it considered that the men had struck and the matter left to the National War Labor Board for conciliation or arbitration.

The men met on the morning of June 4 and decided to strike. The strike lasted about twelve hours, the men returning to work after signing an agreement to leave the matter for conciliation or arbitration by the National War Labor Board.

As the matter now stands, the National War Labor Board will notify the parties interested when and where arbitration or conciliation will be considered. It was presumed that the arbitration would start some time after the joint meeting on June 24 in Washington of the National War Labor Board and representatives and employees of electric railways.

This matter was referred to very briefly in the ELECTRIC RAILWAY JOURNAL for June 15, page 1159.

Service-at-Cost Grant

Ordinance Introduced Into Council of Columbus Fashioned After the Tayler Grant in Cleveland

Councilman Lamneck introduced in the City Council of Columbus, Ohio, on June 17 an ordinance, based upon the terms of the Tayler franchise at Cleveland, which if adopted will take the place of the present grant to the Columbus Railway, Power & Light Company. It provides for a sliding scale of fares subject to adjustment; appointment of a railway commissioner to supervise operation; control of service and fare regulation by Council, and proper extensions and improvements to be designated by the city.

The initial fare would be 3 cents with 1 cent for transfer, but the fare scale would range from 2 cents with 1 cent for transfer to 4 cents or seven tickets for a quarter with 1 cent for transfer. The barometer would consist of an interest fund to start with $500,000. If it should increase to $700,000, the fare would fall automatically to the next rate, but if the fund should be reduced to $300,000, then the fare would be increased.

A board of arbitration would be provided to settle disputes about fares, operation, wages and other questions on which an agreement could not be reached.

The present draft also provides for an increase in the wages of motormen and conductors and other employees, with the provision that the maximum shall be 40 cents an hour. It would guarantee stockholders 6 per cent on their investment as ascertained by an appraisal of the property. The city would have a right to purchase the property on six months' notice at an appraised value plus 10 per cent.

The whole Council on June 21 voted down a motion to consider the Lamneck ordinance, which would have given the company a grant something like the one in force at Cleveland. It was placed on the table where it will remain unless some of the members change their votes.

A resolution was adopted providing for the appraisal of the company's property by the Public Utilities Commission.

A city charter provision requires that the Council must declare its intention to change any franchise before the change is actually made, but City Attorney Scarlett gave an opinion to the affect that this intention can be declared just before the vote on the passage of such an ordinance is taken. One member gave this as his reason for opposing the Lamneck ordinance.

Community Plan Likely

Appeal for Relief by New Orleans Railway & Light Company Results in Counter Proposal from City

The Commission Council of New Orleans, La., has refused the request of the New Orleans Railway & Light Company for an investigation of the merits of the plea of the company for increased revenues based upon the unusual advance in operating costs incident to the present abnormal conditions, but has made overtures to the company for a community of interest operating plan. In consequence, the company feels that it must seek to meet terms proposed by the city or accept the likelihood of the appointment of receivers. D. D. Curran, president of the company, has admitted this. In doing so he has pointed out publicly the general effect of each course.

Co-operation Essential

Under these circumstances it is the opinion of the board of directors that the interests of the community and of the company will be best served by the acceptance of co-operation of the city and of the co-ordinate management proposed, with certain detailed understandings as to method and procedure. In consequence a letter has been sent to the Mayor by Mr. Curran, stating the company's attitude on some of the points under discussion. This statement follows in part:

"1. As to the city's representation on the board of directors of the company, there can be and is no objection on our part. In fact, we shall go further and arrange for one or more of such officials to become members of the executive committee of our company which more intimately directs its affairs.

"2. There is no objection on our part to your honor designating a manager to be elected by the board of directors and to act subject to it.

"3. Our books, records and properties are open to such examination and investigation as you may require to enable you fully to safeguard the public interests.

"4. The company's outstanding obligations and liabilities (other than capital stock) will on July 1, 1918, be almost $43,000,000. While this figure disregards the $30,000,000 stockholders' interest, which, as to the preferred stock, represents actual cash investment at par and, as to the common stock, represents substantial values and rights received and now enjoyed by the company, we are nevertheless willing to accept the former figure as the basis of return pending the valuation to be immediately made of the properties of the company.

Option to City Acceptable

"5. While times are abnormal and interest rates have risen, the company is nevertheless willing to accept the rates of return suggested in your communication of June 4.

"6. The condition for an option to the city of New Orleans to acquire the properties of this company is assented to.

"7. No provision is made in said communication for future improvements, betterments and extensions which will become necessary with the growth and development of this city. These, we assume, will be taken care of by mutual understanding and arrangement.

"8. Said communication proposes no immediate method of proceedure for the ascertainment of the value of our properties. In view of the constantly reiterated charges of over-capitalization, such value should be arrived at with the least possible delay."

The Commission Council has adopted a resolution authorizing the Mayor to take whatever steps may be necessary to consummate and carry out the plan proposed by him and accepted by the company as to principle but not in detail.

President Curran to Bondholders

Reference to these negotiations is contained in the letter of Mr. Curran to the noteholders in regard to the company's inability to meet interest due on June 1. Mr. Curran said:

"As we have already advised you, the inability of the company to pay its two-year debentures at maturity on June 1 was due to unprecedented financial conditions caused by the war. The company appealed to the War Finance Corporation for relief, which was not granted, as the corporation decided it did not have the necessary jurisdiction.

"The company then made immediate appeal to the city of New Orleans for an advance in rates to cover increased operating costs, and as a result of these negotiations the city of New Orleans has entered into an agreement with this company whereby the Mayor, the Commissioner of Public Utilities and the Commissioner of Public Property have become members of the board of directors to insure complete and helpful co-operation in future between the city and the company both as to rates and labor problems. Through this co-operation all of the company obligations will be materially improved and strengthened."

Mayor Behrman and Commissioners Lafaye and Glenny have been elected to the board of the company in accordance with the agreement entered into between the company and the city.

Winnipeg Tied Up Three Days

Electric railway transportation in the city of Winnipeg, Man., was tied up for three days during the week of May 18 owing to 1000 employees of the Winnipeg Electric Railway striking in sympathy with civic employees who went out to enforce demands for a raise. The strike involved 15,000 workers in over a dozen unions. It was the most disastrous in the history of the city. From the time that the first civic employees walked out until a settlement was effected was over a month.

The railway men walked out on the morning of May 22 and a settlement was reached at noon on May 25. The basis of the agreement finally reached between the company and the men was that all matters affecting increase in wages should be arbitrated, with a strike as the last resort.

The Winnipeg Electric Railway suffered severely in loss of revenue. May 24, Victoria Day, came on Friday and preparations on a large scale had been made for entertaining the public at the various parks. Up until noon of the holiday hopes were held out that an agreement would be reached that day and crews were at the various carhouses waiting to take their cars out. The walkout was very regrettable owing to the fact that only last winter a new schedule had been drawn up for the railway men providing for increases in all branches. The best of relations now exist between the company and its employees.

Wage Disputes Before War Board

The strike of trainmen of the electric railways at Dayton, Ohio, which began on June 17, was brought to an end on June 24 through the efforts of Governor James M. Cox. All disputed points will be referred to the War Labor Board for settlement. The men demanded increases in wages and recognition of their union. All the local Dayton lines were affected by the strike.

New York Men Appeal to Public

The Brotherhood of New York (N. Y.) Railways Company Employees has addressed the public as follows:

"Due to the increasing high cost of living the employees of the New York Railways have demanded an increase in their wages, sufficient to enable them to support their families. The financial condition of the company is such that the officers of the company are unable to meet this demand unless they are permitted to charge a 6-cent fare on their cars.

"The Board of Estimate and Apportionment and the Public Service Commission have the power to grant this concession for the period of the war.

"It is to the benefit of the city that the men shall patriotically continue to operate the cars, in order that the public may enjoy an uninterrupted service, and because of this attitude the public should be willing to see that the men get fair wages.

"Unless the employees receive better wages, they will consider themselves free to seek more remunerative employment elsewhere, this will practically mean a shutdown on the street car lines, and the public will be deprived of a necessary means of transportation."

Another Step in Chicago

New Agreement for Operation of Surface and Elevated Line Put Before Bankers

Henry A. Blair, chairman of the Chicago (Ill.) Railways, will outline to the banking interests the features of the traction settlement ordinance agreed upon by the railroads and the Council committee.

There are three banking groups interested. Their individual interest has been to date Harris, Forbes & Company for the Chicago Railways, J. P. Morgan & Company for the Chicago City Railway and the National City Bank for the Chicago Elevated Railways.

The ordinance provides that the companies shall receive as their remuneration 6 per cent guaranteed on their investment now rated at $220,000,000, and 0.35 of 1 per cent additional if earned and accumulative if unearned in any one year. The present 45 and 55 per cent division of net earnings between the companies and the city will be discontinued and the city will receive all that is left after the 6.35 per cent on invested capital. There remains to be worked out the division of the 6.35 per cent among the three companies, but the matter has progressed so far now that an understanding is regarded as a certainty.

Boston Trustees Named

The trustees who are to manage the property of the Boston (Mass) Elevated Railway under the plan to turn the system over to the Commonwealth, noted previously at length in the ELECTRIC RAILWAY JOURNAL, were named by Gov. McCall and confirmed by the Council on June 26, as follows:

Louis A. Frothingham, North Easton.
Galen L. Stone, Brookline.
William M. Butler, Boston.
John F. Stevens, Boston.
Stanley R. Miller, Winchester.

Wages Increased in Spokane

A voluntary increase in the wages of trainmen, effective from June 14, has been announced, by the Washington Water Power Company and the Spokane Traction Company. The increase is approximately 2 cents an hour.

Under the new schedule the operators of one-man cars for the Washington Water Power Company will receive a straight wage increase of 2 cents an hour. The advance affects 85 per cent of the employees of the company. An increase of 2 cents an hour is granted employees on the two-men cars for the first six months period with an average increase of 1 cent an hour for the various classes after that length of time.

A similar announcement was made for the Spokane Traction Company. The scale for that company is as follows:

Two-men cars: first six months, 33 cents; second six months, 33 cents; second year, 34 cents; third and fourth years, 36 cents; fifth year, 37 cents; after five years, 39 cents. One-man cars: first six months, 37 cents; second six months, 38 cents; second year, 39 cents; third and fourth years, 41 cents; fifth year, 42 cents; after five years, 44 cents. Time and a half will be allowed for all overtime.

Massachusetts Commission Reduced

Governor McCall named Chairman Frederick J. Macleod and Commissioners Joseph B. Eastman and Everett E. Stone as members of the newly reorganized Massachusetts Public Service Commission on June 21. Commissioners John F. Meany and Charles A. Russell are retired from the board by the recent legislative act reducing its personnel from five to three. Chairman Macleod is designated for a three-year term, Mr. Eastman for two years and Mr. Stone for one year. The first two named are lawyers and the third an engineer by profession. By the terms of recent legislation the supervision of the Boston Elevated Railway and the Bay State Street Railway will pass to boards of trustees to be appointed by the Governor, but the commission will exercise broad powers of regulation over other electric railways in the State, whether these elect to operate under the general service-at-cost or under the present broad regulative authority of the Public Service Board.

News Notes

New Falls Line Opened.—The International Railway, Buffalo, N. Y., has opened its new Falls line. The plans for the road were described at length some time ago in the ELECTRIC RAILWAY JOURNAL.

Maine Road Increases Wages.—Wage increases were made on June 4 in all departments of the Rockland, Thomaston & Camden Street Railway, Rockland Me. The maximum pay in passenger service was set at $3 and in freight and mail service at $3.10.

Interurban Men Want Increase.—The trainmen in the employ of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., have demanded an increase of 15 cents an hour. Their present contract continues two years more.

Wage Increase in Little Rock.—The Little Rock Railway & Electric Company, Little Rock, Ark., has entered into an agreement with its trainmen for two years dating from June 1 for an increase in the wage scale from 29 cents to 35 cents. The scale has been from 20 cents to 25 cents.

Wages Increase in Asheville.—Announcement has been made by the Asheville Power & Light Company, Asheville, N. C., that the wages of its conductors and motormen have been advanced over the scale established two years ago. The increase will total about $23,000 a year.

Strike Averted.—The threatened strike of trainmen of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., has been averted. Company officials have announced a wage increase varying from 5 cents to 8 cents an hour according to length of service. The men have accepted the increase.

Employees Receive Increase and Fares Go Up.—The City Council of Alliance (Ohio), is said to have agreed to an increase in the rate of fare from 5 cents to 6 cents and as a consequence the Stark Electric Railway has announced an advance of from 7 to 12 cents an hour in the wages of motormen and conductors on both the city and interurban lines.

Shipping Board Has Powers of Expropriation.—On June 18 President Wilson issued an executive order delegating to the United States Shipping Board, Emergency Fleet Corporation, the power granted him under the act of April 22, 1918, to take over transportation systems for the transportation of shipyard and plant employees and for other purposes.

Cleveland Railway Issues a White Book.—The Cleveland (Ohio) Railway has reprinted under date of June 10 in pamphlet form the communications to the City Council in regard to its franchise, wages, street railway fares, etc. The booklet contains twenty-four pages. It should prove of much interest to electric railways in general, but particularly to companies that operate under service-at-cost grants.

Electric Railway Accountants Wanted.—The United States Civil Service Commission announces a competitive examination for examiners of accounts for the Interstate Commerce Commission. There are two grades, one paying from $2,200 to $3,000 a year, the other from $1,800 to $2,100 a year. Some accountants are wanted with electric railway experience and others with steam railroad and other experience. Applicants must not have reached their forty-eighth birthday.

Railway Men in W. S. S. Drive.—Roy Crandall, publicity agent for the International Railway, Buffalo, N. Y.; Elmer M. Hill, Buffalo editorial representative of the ELECTRIC RAILWAY JOURNAL, and W. J. Whiteside, traffic agent for the International Railway, have been appointed members of the publicity committee of the War Savings Stamps campaign committee in western New York. The International Railway has agreed to co-operate in the campaign by placing posters in all its cars.

Wage Increase in Montreal.—The employees of the Montreal (Que.) Tramway have been granted an in-

crease in wages retroactive to June 1, increasing the schedule by about 20 per cent. Conductors and motormen will now receive for the first and second years 31 cents instead of 25 cents an hour, for the third and fourth years 33 cents instead of 26 cents, for the fifth year 35 cents instead of 26 cents and after the fifth year 37 cents as compared with 29 cents heretofore.

Damage from Elevated Construction Denied.—The United States Supreme Court on June 3 sustained the Federal Court in denying damages to Chicago property adjacent to the elevated railroads of the city. The decree of the lower court holding that there was no damage for the reason that property was benefited through concentration of travel from the elevated lines was upheld. The decision affects twenty suits which remain out of 100 cases instituted after the construction of the Chicago elevated loop by the Union Elevated Railroad.

Clearing House Established for Engineers.—Placement of engineers as civilians in any and all government departments as well as in private positions will be the function of the newly-established service clearing house in Chicago of the U. S. Employment Service of the Department of Labor. For some time a division of education has been operating. Last week a division of engineering was initiated with the appointment of A. H. Krom as director, reporting to Dr. P. L. Prentis, district superintendent. Offices have been taken at 29 South La Salle Street, Chicago.

Decides Against Toledo "News-Bee."—The Supreme Court of the United States handed down a decision on June 10 dismissing the writ of error asked by the Toledo Newspaper Company and N. B. Cochran in the contempt case against them in the United States Circuit Court of Appeals for the Sixth Circuit. The case arose during the 3-cent fare controversy in Toledo during 1914. The newspaper attacked the railway and the federal judge who granted an injunction requested by the railway concerning the enforcement of the 3-cent fare ordinance. The Supreme Court upheld the penalty imposed by the federal judge.

W. S. S. Advertised in New York Cars.—Through the courtesy of Theodore P. Shonts, president of the Interborough Rapid Transit Company, New York, N. Y., the company donated to the War Savings Committee for the week of June 21-28 the windows in all subway cars to be used in advertising the intensive war savings drive. The cards bore an extract from the President's message, appealing to every man, woman and child in the United States to become a pledged saver and investor in government securities. Similar cards were placed in all elevated cars, and in all surface cars controlled by the Interborough Company.

Trenton Wages Adjusted.—The wage differences between the Trenton & Mercer County Traction Corporation, Trenton, N. J., and its motormen and conductors have been settled by the company making an offer of 38 cents an hour flat rate to the men. The men voted on June 20 to accept the new offer, after they had insisted upon walking out if their demands for 40 cents an hour were refused. The company recently granted an increase to 35 cents an hour for all platform men and announced that it would pay 37½ cents an hour after July 1. The new rate will go into effect on the latter day. The agreement which had been in force called for 29 cents an hour.

Wants Trenton Indictments Sustained.—Prosecutor A. Dayton Oliphant of Trenton, N. J., on June 22 appealed to the New Jersey Court of Errors and Appeals in litigation to have the Supreme Court overruled in quashing the indictments against the directors of the Trenton & Mercer County Traction Corporation. Argument is to be set down for the November term of court. The Mercer County Grand Jury held the directors responsible for maintaining a nuisance. The case was carried to the Supreme Court. That body ruled that the allegations made did not constitute a crime. Argument will be directed by the prosecutor to prove this decision incorrect.

Government Aids Company.—An order granted in the Supreme Court at Buffalo, N. Y., allows George Bullock, receiver for the Buffalo & Lake Erie Traction Company, to enter into an agreement with the United States Navy Department by which the Navy will finance various extensions and improvements to the company's property for the purpose of advancing war work at Erie, Pa. The court order specifically permits the receiver to lease to the Navy Department twelve motor cars and ten trailers. The Navy, it is reported, is considering the construction of additional trackage in the city of Erie and is planning to reconstruct some old lines so as provide additional transportation facilities for war workers at Erie.

Engineering Council Seeks Committee Helpers.—The Engineering Council is asking for volunteer help among the members of the different engineering societies. The work of the council is conducted largely through committees, many of whom often need special information in some community or state, help in compiling information already accumulated or scouting for men fitted for some particular service. Hence it urges engineers who can help to write to Secretary A. D. Flinn, 29 West Thirty-ninth Street, New York, registering their names and addresses and stating in a general way the extent or nature of service each is willing to render. Here is an opportunity for some of the younger members of the profession to take a hand in society activities, but the request is not limited to men of few years.

Trenton Suburban Men Present Demands.—The employees of the New Jersey & Pennsylvania Traction Corporation, Trenton, N. J., have asked for an increase in pay from 31 cents to 40 cents an hour. The present scale calls for 29 cents an hour, but the company recently granted an increase of 2 cents an hour. The working agreement between the company and men does not expire until 1919. The men and the corporation have forwarded a joint appeal to the War Labor Board at Washington for assistance in settling the wage dispute. On June 22 the men rejected the wage offer of 35 cents an hour, insisting upon original demands of 40 cents flat. The agreement between the men and corporation calls for 29 cents an hour. The company recently granted a raise of 2 cents.

Increase in Wages by New York State Railways.—James F. Hamilton, vice-president and general manager of the New York State Railways, has announced that the company has granted an increase of 2½ cents an hour in pay to its employees in Utica, Syracuse, Rochester and on other lines owned by the company. The announcement followed a conference attended by officers of the Amalgamated Association representing employees of the company at which the union men demanded the increase. They urged in support of their claim that the proposed increase would make the wages of New York State Railway employees equal to those recently granted after a strike to employees of the Schenectady (N. Y.) Railway, United Traction Company and Hudson Valley Railway, Albany, N. Y. Mr. Hamilton has also announced that the company has agreed to submit the question of further increases, should it arise, to the National War Labor Board.

Break in Tama Dam Floods Power Plant.—On June 6 high water caused the breaking of a dam at Tama, Iowa, and the flooding of the Coralville generating plant of the Tri-City Railway & Light Company. The water filled the 14-ft. basement and rose 3 ft. above the operating floor, 3 ft. beyond the highest stage recorded previously. Practically no damage was done to the plant, but 400 tons of coal were washed away and the grounds around the plant were washed out in some places to a depth of 8 ft. Pumps were installed as quickly as possible and there was only a few hours' interruption to service, as a temporary connection was made with the University plant and later a connection with the transmission line of the Iowa Railway & Light Company. On June 12 the water had receded only about 4 ft., but it was believed that the damage would not be serious and that the plant would be in operation again in a few days.

Program of Meeting

Central Electric Meeting Postponed

The summer meeting of the Central Electric Railway Association to be held at The Breakers, Cedar Point, Ohio, has been postponed until July 17 and 18. The meeting was originally set to be held on July 10 and 11.

Financial and Corporate

Electric Railway Statistics

Returns for March, 1918, and for the Quarter Show Mounting Expenses and Stationary Earnings

A comparison of electric railway statistics for the quarter, January-March, 1918, with figures for the corresponding months of 1917, made by the information bureau of the American Electric Railway Association indicates almost no increase in revenue and a considerable increase in operating expenses, with a consequent falling off in net earnings and operating income. All parts of the country are affected, with the Eastern district showing the largest deficit. A similar comparison for the quarter January-March, 1917 and 1916, was far more favorable.

Data for the three months ended March 31, 1918, representing 7517 miles of line of companies scattered throughout the country, figured on the per mile of line basis, indicate an increase in operating revenues of only 2.54 per cent, while operating expenses increased 11.17 per cent and net earnings decreased 13.97 per cent. Data representing approximately 75 per cent of the above mileage indicate an increase in the amount of taxes paid of 4.80 per cent and a decrease in operating income of 22.10 per cent.

The returns from the city and interurban electric railway companies, as shown in detail in the appended tables, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

Of the three groups on the accompanying table the Eastern makes the worst showing and the Southern the best, though as has been pointed out all groups show a decrease in net earnings and operating income.

Data for the Eastern district representing 4885 miles of line, indicated an increase in operating revenues of 1.91 per cent in operating expenses of 12.79 per cent and a decrease in net earnings of 19.61 per cent. Returns representing approximately 70 per cent of the above mileage indicate an increase in the amount of taxes paid of 4.13 per cent and a decrease in operating income of 32.98 per cent. Returns for the Southern and Western groups make a slightly better showing.

The operating ratio for the country

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR QUARTER, JANUARY-MARCH, 1918 AND 1917

Account	United States				Eastern District				Southern District				Western District			
	Amount, January-March, 1918	Per Mile of Line 1918	Per Mile of Line 1917	% Increase Over 1917	Amount, January-March, 1918	Per Mile of Line 1918	Per Mile of Line 1917	% Increase Over 1917	Amount, January-March, 1918	Per Mile of Line 1918	Per Mile of Line 1917	% Increase Over 1917	Amount, January-March 1918	Per Mile of Line 1918	Per Mile of Line 1917	% Increase Over 1917
Operating revenues	$43,098,471	$5,733	$5,591	2.54	$25,788,498	$5,279	$5,180	1.91	$3,758,158	$4,380	$4,194	4.43	$13,551,815	$7,639	$7,360	3.79
Operating expenses	30,683,134	4,082	3,672	11.17	18,956,634	3,881	3,441	12.79	2,281,276	2,659	2,417	10 01	9,445,224	5,324	4,882	9.06
Net earnings	12,415,337	1,651	1,919	†13 97	6,831,864	1,398	1,739	†19 61	1,476,882	1,721	1,777	†3 15	4,106,591	2,315	2,478	†6.58
Operating ratio, per cent	1918, 71.20; 1917, 65,68				1918, 73.52; 1917, 66,43				1918, 60.71; 1917, 57.63				1918, 69 69; 1917, 66 33			
Av. No. miles represented	1918, 7,517; 1917, 7,416				1918, 4,885; 1917, 4,852				1918, 858; 1917, 803				1918, 1,774; 1917, 1,761			

COMPANIES REPORTING TAXES

Operating revenues	$30,600,704	$5,589	$5,497	1 67	$16,317,929	$4,669	$4,623	1 00	$1,876,394	$4,964	$4,696	5 71	$12,406,381	$7,739	$7,588	1 99
Operating expenses	22,564,518	4,121	3,742	10 13	12,727,619	3,642	3,265	11 55	1,121,556	2,967	2,589	14 60	8,715,343	5,437	5,053	7 60
Net earnings	8,036,186	1,468	1,755	†16.35	3,590,310	1,027	1,358	†24.37	754,838	1,997	2,107	†5.22	3,691,038	2,302	2,535	†9.19
Taxes	2,151,945	393	375	4.80	1,147,269	328	315	4.13	158,105	418	400	4.50	846,571	528	500	5.60
Operating income	5,884,241	1,075	1,380	†22.10	2,443,041	699	1,043	†32.98	596,733	1,579	1,707	†7.52	2,844,467	1,774	2,035	†12.83
Operating ratio, per cent	1918, 73.73; 1917, 68.07				1918, 78.00; 1917, 70 63				1918, 59 77; 1917, 55.13				1918, 70 25; 1917, 66,59			
Av. No. miles represented	1918, 5,475; 1917, 5,425				1918, 3,495; 1917, 3,463				1918, 377; 1917, 372				1918, 1,603; 1917, 1,590			

† Decrease

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS MARCH, 1918 AND 1917

Account	United States				Eastern District				Southern District				Western District			
	Amount, March, 1918	Per Mile of Line 1918	Per Mile of Line 1917	% Increase Over 1917	Amount, March, 1918	Per Mile of Line 1918	Per Mile of Line 1917	% Increase Over 1917	Amount, March, 1918	Per Mile of Line 1918	Per Mile of Line 1917	% Increase Over 1917	Amount, March, 1918	Per Mile of Line 1918	Per Mile of Line 1917	% Increase Over 1917
Operating revenues	$15,555,228	$2,062	$1,948	5 85	$9,271,497	$1,898	$1,800	5.44	$1,392,242	$1,623	$1,468	10 56	$4,891,489	$2,721	$2,563	6 16
Operating expenses	10,542,304	1,398	1,264	10 60	6,437,747	1,318	1,180	11.69	810,160	944	822	14 84	3,294,397	1,832	1,690	8.40
Net earnings	5,012,924	664	684	†2 92	2,833,750	580	620	†6 45	582 082	679	646	5 11	1,597,092	889	873	1 83
Operating ratio, per cent	1918, 67 80; 1917, 64 89				1918, 69 44; 1917, 65.56				1918, 58. 16; 1917, 55,99				1918, 67.33; 1917, 65 94			
Av. No. miles represented	1918, 7,541; 1917, 7,440				1918, 4,885; 1917, 4,852				1918, 858; 1917, 803				1918, 1,798; 1917, 1,765			

COMPANIES REPORTING TAXES

Operating revenues	$11,037,803	$2,007	$1,908	5.19	$5,844,583	$1,672	$1,595	4.83	$696,777	$1,843	$1,638	12.52	$4,496,44	$2,764	$2,642	4 62
Operating expenses	7,707,844	1,402	1,287	8 94	4,263,754	1,220	1,115	9.42	395,079	1,045	896	16 63	3,049,011	1,874	1,748	7.21
Net earnings	3,329,959	605	621	†2 58	1,580,829	452	480	†5 83	301,698	798	742	7 55	1,447,432	890	894	†0.45
Taxes	750,221	136	129	5 43	389,715	112	109	2 75	55,891	148	138	7 25	204,615	187	169	10.65
Operating income	2,579,738	469	492	†4 67	1,191,114	340	371	†8 36	245,807	650	604	7.62	1,142,817	703	725	†3 03
Operating ratio, per cent	1918, 69 86; 1917, 67,45				1918, 72.97; 1917, 69.91				1918, 56 70; 1917, 54 70				1918, 67 80; 1917, 66 16			
Av. No. miles represented	1918, 5,499; 1917, 5,450				1918, 3,495; 1917, 3,463				1918, 377; 1917, 372				1918, 16,627; 1917, 1,615			

† Decrease.

as a whole has increased from 65.68 per cent in 1917 to 71.20 per cent in 1918. The operating ratio of the Eastern district has increased from 66.43 per cent to 73.52 per cent.

Attention, Doubters

A Story from Life for Those Who Still Scoff at the Auto as a Menace

The motor car has put three Kansas railroads and one city railway system out of commission and has hit hard at the revenues of three other city systems in the State. The extent of the losses was not made public until the companies owning the lines asked for reductions in the tax valuations this year on the ground that the property was of such small value in revenue production that the tax values should be reduced. J. T. Kincaid, a member of the Kansas Tax Commission, is quoted in part as follows:

"The city railway system at Fort Scott has been abandoned and it will be assessed purely on the junk basis. The Parsons company has offered to give its system to anyone who would operate it. It shows $21,876 more operating expense than operating revenues in the last year. At Emporia, the home of the State normal school, the operating expenses exceeded the operating revenues by more than $5,000. At Lawrence, the home of the State university, the operating expenses were $4,133 more than the revenues. These city railway systems do not have the same junk value as a railroad because of the extensive repairs necessary to pavements if the lines have to be turn up."

Plan Bay State Reorganization

The committee formed to draw up a plan of reorganization for the Massachusetts Electric Companies and Bay State Street Railway held its first conference on June 21. Wallace B. Donham, receiver of the Bay State Street The other members represent the principal security holders' committee, as follows:

Galen L. Stone, representing Massachusetts Electric common stock, Francis R. Hart, representing Massachusetts Electric preferred; Charles G. Bancroft, representing Massachusetts Electric notes; J. Howard Leman (secretary), representing the Bay State coupon notes, and John R. Macomber, representing the refunding bonds. The committee may be enlarged to take in someone to represent the Bay State preferred stock issue.

Mr. Donham presented to the committee the outline of a suggested plan of reorganization as a basis for further discussion. The various protective committees will urge non-depositing stock and bond holders to turn to their securities so that in the work of drafting a plan they may have as large a representation as possible.

Washington Tax Values Cut

The total electric railway valuations for taxation purposes in the State of Washington have been decreased $513,900 or 1.1 per cent for 1918 as compared to 1917. The similar decrease for steam railroads totals $579,266.

The valuation made by the tax commissioner for 1918 on electric lines comes to $43,970,875, as compared to $44,484,775 in 1917. Steam railroads are reduced from $341,091,137 in 1917 to $340,511,871 in 1918.

The accompanying table gives the detailed comparative valuations of the electric carriers. The Puget Sound Traction, Light & Power Company is reduced $20,000, and the Seattle & Rainer Valley Railway $100,000. The Tacoma Railway & Power Company is reduced $65,000, the Spokane & Inland Empire Railroad $300,000 and the Washington Water Power Company $126,750. Six of the other companies show increases, and six valuations have not been changed.

TAX VALUATION FOR WASHINGTON ELECTRIC RAILWAYS

	1917.	1918.
Puget Sound International Railway & Power Co.	$ 1,275,000	$ 1,300,000
Grays Harbor Railway & Light Co.	1,050,000	1,050,000
Lewiston-Clarkston Transit Co.	13,700	22,000
Olympia Light & Power Co.	330,000	362,000
Pacific Traction Co.	272,000	290,000
Puget Sound Traction, Light and Power Co.	18,681,600	18,661,500
Seattle & Rainier Valley Ry.	1,200,000	1,100,000
Tacoma Railway & Power Co.	3,450,000	3,385,000
Western Washington Power Co.	37,500	39,000
Willapa Electric Co.	87,000	87,000
North Coast Power Co.	356,125	356,125
Pacific Northwest Traction Co.	2,542,500	2,542,500
Puget Sound Electric Co.	2,800,000	2,800,000
Spokane & Inland Empire R. R.	3,300,000	3,000,000
Washington Water Power Co.	3,372,000	3,245,250
Walla Walla Valley Ry.	325,000	325,000
Yakima Valley Transportation Co.	392,350	405,500
Total	$44,484,775	$43,970,875

Financial News Notes

New Northern Ohio Issues Approved.—The Ohio Public Utilities Commission has authorized the Northern Ohio Traction & Light Company, Akron, Ohio, to issue $900,000 of 5 per cent bonds and $180,000 of additional preferred stock.

Maine Road Ordered Sold.—S. Thayer Kimball, receiver of the Rockland, South Thomaston & St. George Railway, Rockland, Me., under a decree of the court made on June 21, will receive bids at his office, 414 Main street, Rockland, Me., until July 23 for the sale of the road and appurtenances, either as a whole or in part. The road is 5.7 miles long.

Warren Bicknell Company Selected as Operators—The directors of the Cincinnati & Dayton Traction Company, Cincinnati, Ohio, have placed the operation of the line with the Warren Bicknell Company, Cleveland, Ohio. It had been operated by the Ohio Electric Railway Company for a number of years. The property was then known as the Cincinnati, Dayton & Toledo Traction Company.

Increase in Stock Approved.—The Massachusetts Public Service Commission has approved the application of the Union Street Railway, New Bedford, Mass., to issue $812,500 of new stock, the proceeds to be applied principally to paying for a new power house. The hearing before the commission on the application was referred to briefly in the ELECTRIC RAILWAY JOURNAL for May 11, page 933.

Receiver for Colorado Road.—The Guaranty Trust Company, New York, N. Y., recently filed application with the United States District Court, which resulted in the Denver & Interurban Railway being placed in the hands of William H. Edmunds, superintendent in charge of operation, as receiver. Default is charged in the payment of interest on bonds secured by a mortgage under which the Guaranty Trust Company acts as trustee.

Interest Default Charged.—The Quebec Savings & Trust Company, as trustee for the authorized issue of 60,000,000 francs 5 per cent thirty-year French currency bonds of the Quebec & Saguenay line of the Quebec Railway, Light, Heat & Power Company, Quebec, Que., dated Jan. 1, 1912, gives notice that the holders of the bonds of the issue will meet in Montreal on July 9 to consider what action, if any, should be taken in view of the company being in default.

Puget Sound Bonds Called.—The entire issue of $10,057,000 of 6 per cent bonds of the Puget Sound Traction, Light & Power Company due on Feb. 1, 1919, has been called for payment at par and interest on Aug. 1, 1918, at the office of the Old Colony Trust Company, Boston, Mass. Funds for taking up the issue were provided by the sale recently of $12,250,000 of 7 per cent three-year mortgage gold notes. In addition to the refunding the new issue will enable the company to take care of construction work now under way including the White River, Georgetown and Western Avenue power developments.

Foreclosure Sale in August.—The property of the Woodstock & Sycamore Traction Company, which has been op-

erating south from Marengo to Genoa and Sycamore, Ill., will be sold at public auction under a decree of foreclosure signed by Judge Carnes of the Circuit Court of DeKalb County, Ill. Service was suspended in May. The affairs of the company were referred to in the department "Financial and Corporate" in the ELECTRIC RAILWAY JOURNAL for Jan. 5, April 27 and June 8.

Purchase of Ohio Road Authorized.—The Ohio Public Utilities Commission has authorized the Chillicothe & Camp Sherman Electric Railway to purchase the property of the Chillicothe Electric Railroad, Light & Power Company for $270,800. It is said that the government will advance funds for the construction of a track between Chillicothe and Camp Sherman and that this is the first move against the jitney bus profiteers who are operating bus lines that furnish the only means of getting to and from the camp.

Offering Equipment for Sale.—H. E. Bucklen, receiver of the St. Joseph Valley Railway, Elkhart, Ind., is offering equipment of that company for sale. Included in the material which he is selling are twenty-five side dump ballast cars, one three-compartment passenger car, one snowplow, one steel underframe trailer, one Edison-Beach storage-battery car, one 60-ft. all-steel Hall-Scott gasoline car with three compartments, 15 miles of No. 9 hard-drawn copper phone wire, 60 miles of No. 10 gage copper. The road was sold under foreclosure recently, and only a short stretch of it in Elkhart will be kept in service.

Minneapolis Bond Extension Arranged.—In a circular to holders of the first mortgage bonds of the Minneapolis, Lyndale & Minnetonka Railway and holders of first consolidated mortgage bonds of the Minneapolis Street Railway, William A. Read & Company, New York, N. Y., announced that they are authorized to offer the opportunity of extending these bonds from July 15, 1918, to Jan. 15, 1922, to bear interest at the rate of 7 per cent, an increase of 2 per cent. The extended bonds will be secured by the same mortgage covering the present issue which is a first lien on the entire railway system of Minneapolis. In addition to increased rate of interest the bonds will be unconditionally guaranteed both as to principal and interest by the Twin City Rapid Transit Company. Bondholders are requested to present bonds on or before July 15, 1918, after detaching the coupon due on that date.

Successor to Dan Patch Being Organized.—Articles of incorporation have been prepared for the Minneapolis, Northfield & Southern Railway to succeed as a reorganization the Dan Patch line from Minneapolis to Northfield, officially known as the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company. The capital is to be $500,000. H. A. Whittier, Northfield, is chairman of the reorganization committee whose plan has been approved by the Minneapolis Civic & Commerce Association. The final payment due on July 11 for the line is $175,000. This the committee is raising. Resumption of traffic on the Auto Junction-Luce Line Junction line leading to the heart of the city is expected as soon as an arrangement can be made with St. Louis Park, the principal point, for an advance on the contract rate of 5 cents per passenger into the city. There will be 52 miles of main track and 14 miles of short line.

Wants to Purchase Subsidiary After Foreclosure.—The New York (N. Y.) Railways has applied to the Public Service Commission for the First District for permission to purchase and acquire the property and franchises of the Central Crosstown Railroad, one of its subsidiaries, whose lines it has been operating for many years. A hearing on the application was held during the week ended June 22. It was stated on behalf of the New York Railways that the Central Crosstown Company is soon to be sold at foreclosure, under an order of the Supreme Court in an action brought by the Guaranty Trust Company, as trustee, because of default of principal and interest under the Central Crosstown's first consolidated mortgage. The latter company, together with the Christopher & Tenth Street Railroad, which it has controlled by lease for a long period, possess certain valuable franchise rights which are utilized in the operation of cars of the New York Railways, namely, parts of the Twenty-third, Fourteenth and Eighth Street lines.

Interborough Wants Bond Terms Changed.—The Interborough Rapid Transit Company, New York, N. Y., at a hearing before the Public Service Commission on June 26, asked for permission to issue $58,000,000 in bonds to meet its obligations during the current year. The commission permitted the company to issue $39,000,000 of bonds last summer for the purpose of financing elevated railroad third-tracking, construction, equipment and power house costs. The bonds were to be issued at not less than 93½ per cent of par, but the company now finds no market for them at that price. The company has appealed to the War Finance Corporation for assistance, and, in order to secure the amount of cash required, counsel for the company stated on June 26 that it would be necessary to make a large deposit of collateral and to issue bonds to the amount of $19,000,000 more than permitted by the commission last summer.

Electric Railway Monthly Earnings

BATON ROUGE (LA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$20,816	*$10,403	$10,413	$3,695	$6,718
1m., Apr., '17	18,987	*9,849	9,138	3,497	5,641
12m., Apr., '18	237,946	*124,390	113,556	43,661	69,895
12m., Apr., '17	221,302	*104,042	117,260	42,246	75,014

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

1m., Apr., '18	$7,510	*$9,706	†$2,196	$1,365	†$3,561
1m., Apr., '17	8,784	*9,769	†985	1,184	†2,169
12m., Apr., '18	120,629	*123,392	†2,763	15,531	†18,294
12m., Apr., '17	125,683	*115,708	9,975	13,533	†3,558

CAPE BRETON ELECTRIC COMPANY, SYDNEY, N. S.

1m., Apr., '18	$37,674	*$27,986	$9,688	$6,535	$3,153
1m., Apr., '17	34,508	*21,727	12,781	6,553	6,228
12m., Apr., '18	480,141	*333,326	146,815	78,581	68,234
12m., Apr., '17	413,660	*240,547	173,113	78,606	94,508

COLUMBUS (GA.) ELECTRIC COMPANY

1m., Apr., '18	$94,223	*$39,514	$54,709	$32,797	$21,912
1m., Apr., '17	83,716	*29,751	53,965	28,242	25,723
12m., Apr., '18	1,149,762	*454,419	695,343	375,177	320,166
12m., Apr., '17	955,333	*365,122	590,211	342,377	247,834

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

1m., Apr., '18	$89,317	*$51,409	$37,908	$12,997	$24,911
1m., Apr., '17	75,386	*41,843	33,543	11,547	‡23,493
12m., Apr., '18	975,911	*545,543	430,368	148,164	‡306,774
12m., Apr., '17	874,517	*469,944	404,573	113,185	‡292,884

EL PASO (TEX.) ELECTRIC COMPANY

1m., Apr., '18	$102,665	*$69,344	$33,321	$6,640	$26,681
1m., Apr., '17	101,379	*60,010	41,369	4,649	36,720
12m., Apr., '18	1,274,797	*823,650	451,147	72,941	378,206
12m., Apr., '17	1,179,158	*729,649	449,509	60,573	388,936

GRAND RAPIDS (MICH.) RAILWAY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$99,937	*$77,931	$22,006	$19,421	$2,585
1m., Apr., '17	103,025	*72,419	30,606	18,187	12,419
12m., Apr., '18	1,289,657	*930,274	359,383	225,412	133,971
12m., Apr., '17	1,310,473	*860,495	449,978	201,197	248,781

JACKSONVILLE (FLA.) TRACTION COMPANY

1m., Apr., '18	$74,329	*$50,116	$24,213	$15,980	$8,233
1m., Apr., '17	58,675	*38,495	20,180	15,754	4,426
12m., Apr., '18	749,634	*512,744	236,890	191,189	45,701
12m., Apr., '17	647,964	*434,865	213,099	186,148	26,951

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

1m., Apr., '18	$162,982	*$118,610	$44,372	$36,352	$8,020
1m., Apr., '17	138,104	*93,554	44,550	34,458	10,092
4m., Apr., '18	610,640	*466,831	143,809	145,002	†1,193
4m., Apr., '17	518,395	*367,056	151,339	137,584	13,755

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

1m., Apr., '18	$267,913	*$157,422	$110,491	$28,236	‡$91,838
1m., Apr., '17	175,359	*104,007	71,352	29,158	42,194
12m., Apr., '18	2,932,282	*1,646,832	1,285,450	345,562	‡1,006,971
12m., Apr., '17	2,028,964	*1,200,271	828,693	348,357	480,336

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

1m., Apr., '18	$24,712	*$16,616	$8,096	$8,014	$82
1m., Apr., '17	23,865	*18,822	5,043	7,196	†2,153
12m., Apr., '18	304,060	*228,035	76,025	93,374	†17,349
12m., Apr., '17	311,379	*229,879	81,500	86,465	†4,965

PENSACOLA (FLA.) ELECTRIC COMPANY

1m., Apr., '18	$35,008	*$24,138	$10,870	$8,120	$2,750
1m., Apr., '17	24,057	*15,189	8,868	7,813	1,055
12m., Apr., '18	391,640	*238,931	152,709	94,644	58,065
12m., Apr., '17	290,118	*167,831	122,287	92,899	29,388

* Includes taxes † Deficit ‡ Includes non-operating income.

Traffic and Transportation

Two Days' Session in Atlanta

July 2 Fixed as Date for Filing Briefs in Georgia Railway & Power Rate Case

The hearing before the Railroad Commission of Georgia on the application of the Georgia Railway & Power Company, Atlanta, Ga., for permission to increase rates was resumed on June 12. Judge Arthur G. Powell, chief counsel for the people's committee opposing the increase in rates, opened by cross-examining Preston S. Arkwright, president of the company, on his testimony given at the hearing of the company's evidence in support of its petition.

Among the matters gone over somewhat in detail while Mr. Arkwright was on the stand were depreciation, excess profits, steam power costs, the company's tax returns and the credit of the company. According to Mr. Arkwright, the common stock of the company is quoted at $8 a share, the second preferred at $17.50 a share and the preferred at $78 a share. There is no market for the bonds.

Mr. Arkwright considered the company was justified in paying out $120,000 in dividends in 1917 on its first preferred stock. He contended that it was necessary to pay dividends in order to sustain a corporation's credit and he further contended that the dividend paid in 1917 was not paid from 1917 earnings, but from earnings accumulated since the organization of the company. At the afternoon session Mr. Arkwright was questioned in regard to work already done by the company, work proposed by the company and the history of some of the transactions by which the present company was built up.

At the session on June 13 Chairman Candler announced that the commission had decided to allow the attorneys for the people's committee until June 27 to prepare their evidence and briefs, and thereafter to allow until July 2 for the filing of reply briefs. This was in compliance with the request of the attorneys for the people's committee for an extension of time.

The announcement of the commission's decision with regard to an extension of time was made after George W. Brine, vice-president and general manager of the company, had been examined and cross-examined concerning his estimate of the company's net income for the year 1918.

At this session Joel Hurt, who built the first electric railway in Atlanta and is a past-president of the American Electric Railway Association, went over some of the early financial history of the company. He said that after the sale of his interests in Atlanta public utilities he had been approached by Mr. Atkinson, now chairman of the board of the company, with an offer of common stock in the consolidated company and promise of election as a director, but that he "refused to be a part to any such over-capitalization."

Mr. Arkwright denied Mr. Hurt's assertion in regard to the common stock of the company. He disputed Mr. Hurt both as to the amount of the common stock, and as to the stock issue being excessive. He said that the common stock was not given as a bonus, but was paid to the owners of the various subsidiary street railways consolidated by the Georgia Railway & Electric Company, operated by the Georgia Railway & Power Company, and represented an actual property value. Mr. Atkinson told about his conversations with Mr. Hurt. He said that he "certainly did not tell Mr. Hurt anything about the securities we proposed to issue." W. H. Glenn, vice-president, secretary and treasurer and operating manager, sought to show that Mr. Hurt's testimony was prompted by aminus.

Status of East St. Louis Appeal

Brief references were made in the ELECTRIC RAILWAY JOURNAL of June 8 and June 22 to fare applications by the Alton, Granite & St. Louis Traction Company and the East St. Louis Railway, controlled by the East St. Louis & Suburban Company, East St. Louis, Ill., for permission to increase fares. The appeal is for a rate of 2 cents a mile on the Alton, Granite & St. Louis Traction lines, and for an increase of 10 per cent in commuter rates.

The Alton, Granite & St. Louis Traction Company operates the city lines in Alton and the company is asking for a fare of 7 cents with four tickets for 25 cents, and 1 cent for each transfer.

Transfers in Alton and East St. Louis on the Alton, Granite & St. Louis Traction Company lines will not be accepted as a part of the interurban fare, but only for an extended ride within the city limits of said cities. The Alton Granite & St. Louis Company operates the Venice-Brooklyn-East St. Louis (city limits) line. The company wants a 7-cent fare on this branch.

The hearing before the commission on the 2-cent rate was held on June 18, but the commission has not yet handed down its decision. The date for the hearing on the Alton City and Brooklyn-Venice increased fares has not yet been set by the commission.

On June 20 the East St. Louis Railway filed a petition for increased fares in the city of East St. Louis, as follows: basic fare of 7 cents, five tickets for 30 cents; transfer privileges in East St. Louis will be the same as at present. Hearing of the East St. Louis case has not yet been set.

Home Rule Exponent Speaks

Opponent of Commission Control of Fares Advocates Liberal Attitude by Cities Toward the Railroads

Richard C. S. Drummond, city attorney of Auburn, N. Y., and chairman of the special committee of the conference which conducted the opposition of the cities of New York State to the application of the electric railways to the Public Service Commission for increased fares, was one of the speakers on June 12 before the State conference of mayors and other city officials held at Newburgh. He said that the question of permitting surface railways to increase their fares should be considered on the part of municipal authorities frankly and in a straightforward fashion and without rancor. Each municipality must decide for itself. He is quoted as follows:

"Our ideas upon these questions affecting public utilities and public service enterprises are changing very rapidly. If, in order to exist, the railway companies must have more money, that revenue must be provided. If it can be provided in no other way save by increased fares, increased fares must be granted. Each municipality must decide for itself.

"More or less investigation will be required undoubtedly in each individual case. If the results of such investigation are such as to lead the responsible authorities of a municipality to look with favor upon the proposition that increased fares must be authorized, then in the case of those municipalities which have rate limitations in the railroad franchise, it must be determined how this consent is to be conferred and what terms and stipulations should be insisted upon in respect to the modification or suspension of the rate provisions of the existing franchise contracts.

"It is one of the most perplexing matters with which courts and lawyers have been confronted in many years. The law is unsettled and the extension of existing legal principles to the new conditions is a matter of special difficulty. Nevertheless, the matter is one to which we shall have to address ourselves. It seems practically impossible to escape the conclusion that fares must be increased. Conditions are shifting so rapidly that nothing can be designated as certain or definite.

"If our advice had been heeded by the railways and the commission and if our suggestions had been adopted, a great deal of confusion, expense, bother and uncertainty would have been avoided. But as it was we were gazed upon with cold distrust and suspicion and received snubs and refusals. All of our predictions have come true. From the beginning we insisted that the matter was one to be taken up with the local authorities. Now, by virtue of the decision of the highest court of the State, it has been found that this is the only thing that can be done in these franchise cases."

Buffalo Fare Progress

If Commission Sanctions Six-Cent Agreement Company Will Sell Seventeen Tickets for $1

The board of directors of the International Railway, Buffalo, N. Y., at a meeting held on June 20 voted to ratify the agreement made between E. G. Connette, president of the company, and the City Council of Buffalo in which the city recommended to the Public Service Commission that the company be allowed to charge a 6-cent fare on its lines within the city on certain conditions. As soon as the board ratified the agreement, application was made to the Public Service Commission, Second District, for permission to put the 6-cent fare into effect immediately. In a communication to the City Council Mr. Connette said that if the 6-cent fare was approved by the commission, the company would sell seventeen tickets for $1.

WAGE MATTER STILL UNSETTLED

No permanent agreement has been reached between the company and its platform employees in regard to a scale of wages. The company has offered the first-year men 35 cents an hour, second-year, 37 cents; third-year, 39 cents and after three years 42 cents an hour. The company will allow the scale to be retroactive to June 1. The employees have rejected this offer and the matter will probably be left for the War Labor Board to decide.

Two steps have been taken by taxpayers and voters of Buffalo to have the agreement between the City Council and the company set aside. Petitions are now being circulated by associations of businessmen which call for a referendum vote on the agreement. Under the commission charter all actions taken by the Council can be reviewed by the voters at a referendum. About 4000 signatures are required to force a referendum.

OPPOSITION ORGANIZES

The second action has been started by a committee of prominent citizens. Five lawyers have been engaged and application has been made for an injunction to restrain the city from being represented before the proposed hearings before the Public Service Commission, on the 6-cent fare. It is set forth in the petition that the action of the Council is illegal and in violation of the Milburn agreement between the city and the Council which has been approved by the State Legislature. It is pointed out that an act of the Legislature is needed before the Council has authority to agree to a 6-cent fare.

Railways Act Against Jitneys

Acting under a law passed at the last session of the Massachusetts Legislature, the Massachusetts Northeastern Street Railway; Union Street Railway of New Bedford; Bay State Street Railway and Nahant & Lynn Street Railway have appealed to the Public Service Commission for relief from jitney competition in the territories served by these roads.

The Massachusetts Northeastern company appeals against jitney competition in Salisbury and Newburyport. The Union company desires to preserve its rights in New Bedford, where the Board of Aldermen is now considering jitney service and regulations. The Bay State company filed twenty-eight petitions saving its rights in fifty-eight cities and towns having or reported to have jitney service, and asking the commission to investigate the use of jitneys in these places and to issue orders for the relief of the company. The Nahant & Lynn company asks that the commission abolish the jitney service between these two points for numerous reasons, principally on the grounds of irregularity and irresponsibility.

The Connecticut Valley Street Railway has also petitioned the commission for authority to establish a motor-operated freight service between Northampton and Springfield.

Roads Appeal to the I. C. C.

Among applications from electric railways placed on file recently with the Interstate Commerce Commission are the following:

Southern New York Power & Railway Corporation—Increase of 25 per cent in class and commodity rates applicable between points on its line published in Tariffs I. C. C. Nos. 8, 10, 11 and 12, based on increase authorized in Director-General's general order No. 28 of May 25, 1918.

Cleveland, Southwestern & Columbus Railway—Increase of 25 per cent in class and commodity rates between points on its line and from points on its line to stations on connecting lines, published in Tariffs I. C. C. Nos. 18, 22 and 23 to basis authorized by Director-General's general order No. 28 of May 25, 1918.

Cleveland, Southwestern & Columbus Railway—Increase in passenger fares to basis of 3 cents per mile between stations on its line and from stations on its line to points on connecting lines published in Tariffs I. C. C. Nos. 19, 20 and 33.

Grand Rapids, Grand Haven & Muskegon Railway—Increase of 25 per cent in the class rates from points on its line to Milwaukee, Wis., published in Tariff I. C. C. No. 143, based on increase authorized by Director-General's general order No. 28 of May 25, 1918.

Western New York & Pennsylvania Traction Company—Permission to increase both passenger and freight charges to the level of the new steam railroad rates.

On June 13 application for increasing passenger fares to 3 cents a mile and freight rates 25 per cent were filed with the Interstate Commerce Commission by the Buffalo & Lake Erie Traction Company, and the Kansas City, Kaw Valley & Western Railway. The Lackawanna & Wyoming Valley Railroad asked to increase passenger fares to a basis of 2½ cents a mile.

The Courts a Final Resort

St. Louis Sees Last Ray of Hope in Its Fare Case Against United Railways

The city counselor of St. Louis, Mo., has taken steps to appeal from the decision of the Public Service Commission of Missouri granting the United Railways the 6-cent fare.

The city's appeal through the Circuit Court is based on two allegations:

First, that the commission had no authority to set aside the contract rate of 5 cents.

Second, that the 6-cent fare is excessive.

Only recently the Supreme Court of Missouri ruled that the commission has the right to raise as well as to lower rates without regard to contract or franchise stipulations. This was the ruling in the so-called Sedalia case.

The decision of the Supreme Court upholding the power of the Public Service Commission to set aside franchise contracts was unanimous. It was written by Chief Justice Graves. The city of Sedalia had appealed from an order of the commission upholding a franchise contract with the Sedalia Water Company. In discussing the powers of the commission to set aside franchise contracts, under the police power of the State, Judge Graves wrote:

"The sovereign police power of the State is preserved intact, irrespective of contracts with reference to rates for public service. No contract as to rates will stand as against the order of the Public Service Commission for reasonable rates, whether such reasonable rates are lower or higher than the contract rates. Under the constitution and the public service commission act, the commission is exercising the police power of the State by its delegated authority from the Legislature Its rates, therefore, constitutionally and legally supersede any and all contract rates."

Hearing on Albany Fares

A hearing was held on June 18 before the Public Service Commission for the Second District of New York on the application of the United Traction Company, Albany, for establishing a zoning system to increase its revenues. It was preliminary to further hearings by the commission.

Government representatives advocated a 6-cent fare for the Albany and Troy districts and a round-trip fare of 15 cents between Albany and Watervliet for arsenal workers. They advocated there rates as war measures, and wanted the 15-cent round-trip rate for Watervliet arsenal workers at once.

Mayor Watt and the representatives of the Albany Chamber of Commerce are opposed to 6-cent fares, but advocate an equalization of rates between the arsenal and all neighboring communities, so that the government can take advantage of the ample housing facilities of Albany.

Must Abide by Franchise

Ohio Court Rules that Franchise Contracts With Fare Requirements Must Stand as Accepted

The Supreme Court of Ohio on June 20 sustained a ruling of the Public Utilities Commission of that State to the effect that it has no authority to increase the rates of fare of interurban roads which have accepted certain rates in consideration of franchises from the cities and counties through which they pass. Among the companies affected by the decision are the Mahoning & Shenango Railway & Light Company, Youngstown; the Toledo, Bowling Green & Southern Traction Company, Findlay, and the Interurban Railway & Terminal Company, Cincinnati. All of these are subject to franchise conditions. The court views such franchises, accepted by the companies, as contracts which cannot be abrogated under the law. The only relief seems to be with the cities and counties through which they pass or with the Legislature, in case it is found necessary to take action.

The Mahoning & Shenango Railway & Light Company had asked the privilege of increasing its rates of fare between Youngstown and Warren and Youngstown and Hubbard. The court held that the franchises granted by the City Council of Youngstown and the Commissioners of Trumbull and Mahoning Counties must stand, unless altered by the city and the counties mentioned.

In the case of the Interurban Railway & Terminal Company the franchises of the former villages of Pleasant Ridge and Kennedy Heights permitted passenger rates ranging from 7 cents to 10 cents, but provided that in the event of the annexation of these places to Cincinnati a rate of 5 cents should be established. When the annexation was made, however, the company appealed to the commission, which ruled against it. This ruling is the one just approved.

The circumstances surrounding the Toledo, Bowling Green & Southern road are similar to those of the Mahoning & Shenango Railway & Light Company.

Skip Stops Likely for Chicago

Action taken by the committee on local transportation of the City Council of Chicago, Ill., on June 19 paved the way for the adoption of skip-stop operation on the Chicago Surface Lines, and makes it probable that the proposed ordinance will go into effect in a few weeks. At the suggestion of a representative of the federal fuel administration, the committee took the matter under advisement several weeks ago. The public service department of the city reported favorably after a careful investigation. As a result an ordinance was drafted and will be presented soon to the City Council.

The selection of proposed stopping places for cars was made on a novel basis. In Chicago the houses are numbered on an exact basis of 800 to the mile. Some blocks are longer than others, and while in certain districts there are at present only eight stops to the mile, there are many other locations where twice that many stops are made. The proposed ordinance requires that stops be made only where the "hundred number" or multiples of that occur. This will mean a maximum of eight stops to the mile except where added stops are made for safety purposes. The ordinance will go into effect fifteen days after passage and publication.

York Wants Six-Cent Fare

The York (Pa.) Railways, which serves York and adjacent towns, is seeking an increased fare schedule.

Despite the fact that the Attorney General of Pennsylvania rendered an opinion to the Public Service Commission that, notwithstanding municipal franchises, the commission has power to alter franchise rates, the York Railways has taken up the matter of rates with the Council of York. It will then go to the commission. It asks that the Council go on record as favoring the suspension of the rate clause for the period of the war, and a period of readjustment after the war to be fixed by the Public Service Commission.

It is proposed to raise the basic cash fare in York to 6 cents, and the fares on the interurban lines to about 2½ cents a mile. The interurban lines are not governed by fare-limiting franchises.

The proceeding is an emergency action to enable the company to meet increased costs, including an advance in wages and to provide a further increase in wages as soon as higher fares are established.

Pittsburgh Goes to Five Cent-Seven Cent Fares

A 5 cent-7 cent fare was placed in effect on the properties of the Pittsburgh (Pa.) Railways on June 20. It supersedes the 5½ cent fare which has been in effect on the lines of the company since Jan. 22 last.

The city of Pittsburgh has been divided in such a way that a central 5-cent area varying from 2.2 miles to 3 miles in radius covers the main business district. Any passenger passing outside of this area, or vice versa, or riding on the cars entirely beyond this area must pay a fare of 7 cents.

Passsengers boarding the cars in the downtown district pay a fare of either 5 cents or 7 cents as they leave the car depending upon the point of disembarkation. This permits the use of all doors and faster loading during the rush hours. Fares of a like denomination are collected from passengers as they board an unbound car. Tickets are being sold eight for 55 cents.

The new system of fares was inaugurated without friction as the public had been advised in advance of the change and understood the arrangement.

Ohio Interurbans Act

Thirteen Roads in That State Seek Higher Rates, Some Both Passenger and Freight Advances

It was announced by the Public Service Commission of Ohio on June 18 that thirteen interurban railroads had filed applications with the commission for advanced rate schedules. The companies want to increase their passenger fares to 3 cents a mile and their freight rates 25 per cent. Each road's application will be considered separately and the decision of the commission in each instance will be based on whether the roads prove that increases are imperative.

The Northwestern Ohio Railway & Power Company has filed new tariffs providing for a passenger rate of 2½ cents a mile, but it also has a petition on file asking 3 cents in the event other interurbans get that amount.

These interurbans have asked for higher passenger rates only:

Northern Ohio Traction & Light Company; Fostoria & Fremont; Cleveland, Painesville & Eastern; Southeastern Ohio Railway; Cleveland, Alliance & Mahoning Valley. All these want 3 cents a mile. The Detroit, Monroe & Toledo Short Line asks 2½ cents a mile.

These lines want both passenger and freight rates raised:

Western Ohio; Ohio Electric; Stark Electric; Sandusky, Norwalk & Mansfield.

These lines ask freight increases only:

Scioto Valley Traction and Toledo & Western.

Beecher W. Waltermire, member of the commission, made the following statement:

"If one interurban is granted an increase it will not mean that another road more favorably situated will be given a similar increase. Not long ago the interurbans told us the automobile was emptying their cars. To some who have been in to talk about increased rates I have said, 'Now is your chance to fill your cars.'"

Six-Cent Fare for Kansas City

The Public Service Commission of Missouri, declaring that its duty is to see that the public receives service from utilities, and that such service cannot be rendered without adequate returns, on June 22 granted a 6-cent fare in Kansas City, Mo., to the Kansas City Railways.

The 6-cent rate is to go into effect on July 15, for a year. After that time the commission will continue the higher rate if still necessary, or make other adjustment. An intermediate fare is even regarded as a possibility.

Under the decision, the company will continue to give universal transfers. The fare for children will continue at 2½ cents. The commission suggests that the company issue coupon books, or discs, for the convenience of the public.

Transportation News Notes

New B. & W. Freight Tariff.—The Boston & Worcester Street Railway, Boston, Mass., has filed with the Public Service Commission a new freight tariff increasing rates 15 per cent to conform with the recent increase granted to the railroads.

Missoula Wants a Seven-and-a-Half-Cent Fare.—The Missoula, (Mont.) Street Railway has made application to the State Railroad Commission of Montana for permission to increase fares from 5 cents to 7½ cents. A hearing has been set for July 1.

Skip Stops in Louisville.—On June 16 the Louisville (Ky.) Railway started the staggered skip-stop plan on the city lines south of Oak Street, west of Eighteenth Street and east of Shelby Street. Stops are being made at all downtown street intersections.

Rates Over Thirty-Five Cents Raised.—The Texas Electric Railway, Dallas, Tex., announces an increase of 8 per cent on all fares of more than 35 cents, in accord with Section 501 of the war revenue law, defined as an "act to provide revenue to defray war expenses and for other purposes."

Straight Five-Cent Fare in Asheville.—The Asheville Power & Light Company, Asheville, N. C., has announced the discontinuance of the sale of six tickets for 25 cents. Every cent of additional revenue derived from the straight 5-cent fare will be absorbed by a recent wage increase to the trainmen, the company estimates.

Three-cent Rate on W. W. P. Line.—Officers of the Washington Water Power Company, Spokane, Wash., recently filed with the Public Service Commission at Olympia a tariff raising the passenger rates on the Medical Lake and Cheney lines to a flat 3 cents a mile and the freight rates 25 per cent, effective on June 25.

Hearings in July on Increased Fares.—The Public Utilities Commission of Ohio has announced that hearings will be held on July 10, 11 and 12 on application of three or four of the dozen or more roads which recently asked for an increase in the rates of fare. Applications for increased freight rates will not be taken up at that time.

Chattanooga Feels the Pinch.—F. W. Hoover, second vice-president of the Chattanooga Railway & Light Company, Chattanooga, Tenn., recently indicated that there will be an increase in the fares at some future date. An idea of the increased cost of materials was given the people of Chattanooga in a recent advertisement in the papers.

Fare Rebate Slips in Johnstown.—On June 12 the Johnstown (Pa.) Traction Company began to issue slips acknowledging that it was receiving from patrons 1 cent in excess of the prior established rate of fare. The slips will be redeemed by the company if the Public Service Commission should decide that the new fare is excessive.

Four Men Killed in Ohio Wreck.—A car of the Northern Ohio Traction & Light Company, Akron, Ohio, jumped the track and dropped a distance of 75 ft. from the bridge into the Cuyahoga Gorge at Cuyahoga Falls on June 11. The conductor and three other men were killed outright, while the motorman and another man were badly injured.

Many Persons Hurt in Newark Accident.—More than fifty persons were injured when a car on the Newark line of the Public Service Railway between Jersey City and Newark on June 21 ran across an open switch at the Montgomery Street yards, about 100 ft. from the Passaic River bridge at the Lincoln Highway and South Seventh Street, Newark, N. J.

Fare Increases Suspended.—The Public Service Commission for the Second District of New York on June 11 dismissed the petition of the Rochester, Syracuse & Eastern Railroad and the Empire United Railways, Inc., for permission to charge a 6-cent fare. The decision of the Court of Appeals in the Rochester case applied to the application. Rochester asked for a dismissal of the petition.

One-Man Car for Hornell.—The Hornell (N. Y.) Traction Company, now being operated by a receiver, will establish the one-man system on its local lines on July 1. The company has petitioned the Public Service Commission for permission to use the tracks of the Pittsburgh, Shawmut & Northern Railway, which connect with the North Hornell line. It is planned to operate regular service over this line.

Would Reduce Its Fare.—The International Railway, Buffalo, N. Y., has filed application with the Public Service Commission, for the Second District for permission to reduce its rate of fare between North Tonawanda and Buffalo from 30 cents to 25 cents and from North Tonawanda to Lockport from 40 cents to 35 cents. The reduced fares will become effective on July 1, if the commission approves the new schedule.

Increase in Fare Asked at Akron.—The Northern Ohio Traction & Light Company, Akron, Ohio, on June 24 made formal application to the City Council for permission to increase the rate of fare for a continuous ride within the city to 6 cents. The present rate is 5 cents, six tickets for a quarter and twenty-five for $1. The petition has been reprinted in the form of an eight-page pamphlet 6 in x 9 in. for general distribution.

Maine Company Increases Zone Unit.—The Atlantic Shore Railway, Kennebunk, Me., has filed with the Public Utilities Commission of Maine a new schedule of passenger fares to become effective on July 7, 1918, being a change of fares from 6 cents to 7 cents with the exception of the zone between Sanford and Springvale, where the fare will be changed from the present rate of 6 cents to 5 cents. The company proposes to advance the price of ticket strips having nine coupons from 50 cents to 55 cents.

Tri-City Will Seek Increase.—The Tri-City Railway, Davenport, Ia., will probably go before the Public Utilities Commission of Illinois soon to ask a 6-cent fare in Rock Island, Moline, East Moline and Silvis. Similar action will be taken on the Iowa side at the same time. J. G. Huntoon, general manager of the company, said recently: "The company feels that the employees are entitled to more money than they are getting at present and the only way to grant them this increase will be to increase the present fares."

Salamanca Is Willing.—The Common Council of Salamanca, N. Y., has voted to waive the 5-cent fare clause in the franchise of the Western New York & Pennsylvania Traction Company in order that the company may go before the Public Service Commission and ask for an increase in passenger rates. The Council believes that the company is entitled to more money for its passenger service. The agreement of waiver is only temporary, for the grant is for a period of three years, or until a year after the close of the war.

Fare Increase in Quebec.—The City Council of Quebec, Que., has granted fare increases to the Quebec Railway, Light, Heat & Power Company as follows: Five tickets for 25 cents, instead of six; seven workingmen's tickets for 25 cents, instead of eight, which are limited for bona fide workingmen, good between the hours of 6 and 8 a.m. and 5 and 7 p.m., except Sundays. The by-law which was passed granting the increases became effective on June 16, but will not be enforced by the company until the new tickets are printed.

Houston Company Would Increase Fares.—The Houston (Tex.) Electric Company has made application to the City Commission for authority to increase its fares effective on July 1. David Daly, manager of the company, appeared before the City Commission with an exhaustive financial statement showing the need for a fare increase. The company wants to charge 6 cents with 3 cents for half fares and to continue to give transfers as at present. Mr. Daly estimated that this fare increase would increase the company's income by 10 per cent.

Birmingham Commission Won't Accept Responsibility.—The City Commission of Birmingham, Ala., has refused to adopt a proffered ordinance permitting the Birmingham Railway, Light & Power Company to charge a 6-cent fare for passenger service. The petition containing more than the required 1500 names was automatically referred to the County Election Commission. The commission has the power, it is said, to refuse to call the election, but it is

expected the members will act in the customary manner and let the case go before the people for final decision.

Tickets Restored.—The Des Moines (Ia.) City Railway has restored the sale of six tickets for a quarter at its own offices. This action was taken to meet the demand of the City Council and is only temporary. The Council ordered restoration of the sale of tickets until such time as it considered the answers submitted by the City Railway to a questionnaire prepared by the city attorney. No tickets were placed on sale in other than company offices and the sale of tickets is limited to the extent of $1 for each purchaser.

Would Increase Interurban Fares.—The Eastern Wisconsin Electric Company, Sheboygan, Wis., has applied to the State Railroad Commission of Wisconsin for permission to increase its fares on the interurban lines running out of the cities of Sheboygan, Fond du Lac and Oshkosh. The petition of the company does not specify the exact fare increases desired, but merely calls attention to the present inadequate revenue and asks for such relief as may be fair and equitable. It is probable that at the hearings to be held on these petitions, a definite rate per mile will be requested.

Fares Increased One-Half Cent a Mile.—The Lackawanna & Wyoming Valley Railroad, Scranton, Pa., the Laurel Line, has filed with the Public Service Commission of that State a new tariff of rates effective on July 7. The fares in this tariff have been increased from a general basis of 2 cents to 2½ cents per mile. Children's fares are established. Mileage detachments have been reduced in some instances and increased in others. Thirty-trip commutation fares are to be continued at an increase of 10 per cent. The road connects Scranton, Pittston and Wilkes-Barre.

Tells Philadelphia Commission Has Authority.—The street railway committee of the Council of Philadelphia met on June 20 for the purpose of considering an ordinance granting permission to the Philadelphia Rapid Transit Company to increase the fare from 5 cents to 6 cents. Director of City Transit W. S. Twining appeared before the committee and in a statement said that the Public Service Commission had full power to fix the rate of fare and that there was no occasion for the Council to take up the question. The chairman was directed to make a report to that effect to the Council.

Cleveland Alive to Zone System's Advantages.—Fielder Sanders, Street Railway Commissioner of Cleveland, Ohio, is securing data on the zone system in other cities in order to apply it in Cleveland if the necessity should arise. Engineers in his office are working on a scale of zones which will be presented to the Council committee on street railways. The Council requested the committee to consider the zone system some time ago, in order that it might be tested in case the employees of the Cleveland Railway receive an increase in wages that will necessitate a larger income.

Wheeling City Company Seeks Increase.—The Wheeling (W. Va.) Traction Company has applied to the Public Utilities Commission of West Virginia for permission to increase passenger rates between Wheeling Loop and Wellsburg and intermediate points on the Panhandle Division and between Wheeling and Moundsville and intermediate points on the Moundsville division. The company also desires to increase freight rates between Wheeling and Moundsville and intermediate points. The company will also ask permission of the Public Utilities Commission of Ohio to increase rates on its lines on the Ohio side of the river.

An Additional Four-Cent Zone Allowed.—On April 30 the Public Service Commission of West Virginia, as noted in the ELECTRIC RAILWAY JOURNAL of June 8, page 114, authorized an increase in fare charged by the City & Elm Grove division of the West Virginia Traction & Electric Company from 5 cents to 6 cents. This was followed on May 29 by another order, permitting the company to establish a new zone, cutting the ride between Wheeling and Elm Grove approximately in half, and charge an additional 4-cent fare in the new zone. It is expected that these increases in fare will increase this division's income by about $75,000 a year.

Seven Fare Units Replace Four.—The Attleboro Branch Railroad and the Interstate Consolidated Street Railway, Attleboro, Mass., both controlled by the New England Security & Investment Company, have applied to the Public Service Commission of Massachusetts for permission to increase the fare upon the 26 miles of track operated jointly. The plan of 5-cent fare units will be retained, but the four fare sections will be shortened and the number increased to seven. For convenience of passengers, the company will print books of twenty tickets to be sold for $1. The commission has suspended the new schedule until Aug. 1, pending a hearing.

Towns and Villages Agree to Fare Raise.—The town boards of Portland, Westfield and Ripley and the village boards of Westfield and Ripley, N. Y., have agreed that the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., may increase its rates for interurban passenger service through these localities, and the Public Service Commission for the Second District will be asked to determine what is a fair and equitable rate. At a joint conference of these village and town boards it was decided that the company is in need of additional revenue, and in view of the recommendation of the commission which held that although the company needed additional revenue, it had no authority to allow the company to raise its rates because of local franchises and agreements.

Fare Appeal Denied.—The Railway Commission of Nebraska has denied the petition of the Lincoln Traction Company for permission to increase its rates in the city of Lincoln and has ordered the cancellation of every dollar of common stock of the company and the return of all dividends paid on this stock since that security was issued in 1909. The amount of the stock ordered cancelled is $1,652,000 and the dividends ordered repaid by the stockholders amount to $198,288. The company has appealed the decision to the Supreme Court. In February the commission denied an emergency appeal of the company. On March 4 it began hearing an appeal for a permanent increase in rates. On April 23 this case was closed. These developments have all been reviewed in the ELECTRIC RAILWAY JOURNAL.

Eight-Cent Zones on Pennsylvania Road.—On June 12 the Schuylkill Railway, Girardville, Pa., filed with the Public Service Commission a new schedule of an 8-cent zone fare over all of its lines, effective on July 12. The average length of zones is 3.55 miles. The average rate per mile at the 8-cent fare, therefore, is 2¼ cents. This increase in fare is made to meet imperative needs of the company and in conformity with the General Order No. 27 of United States Director-General of Railroads William G. McAdoo, issued on May 25, in which Mr. McAdoo explicitly calls upon the managers of all interurban lines to conform as nearly as possible to the federal passenger tariff therein promulgated. On account of the varying lengths of zones on the lines of the Schuylkill Railway the company has in the establishment of the 8-cent fare approached as nearly as it could, in spirit and practice, to the policy outlined in Mr. McAdoo's letter.

Ticket Fares Go in Springfield.—The elimination of fares at less than 5 cents, except for children, will be asked of the Public Service Commission of Missouri by the Springfield Traction Company. The company at first had under consideration an increase of fares to 6 cents. It was decided, however, to try the smaller fare to ascertain if the additional revenue will enable the company to wipe out its monthly deficit of about $1,000. The company has a contract with its men made one year ago which has two more years to run and while the scale of wages is fixed in this contract, the company felt that owing to changed conditions since the contract was made, there was some justification to the request of the men for more pay. As the company is running behind at the rate of nearly $1,000 a month, it is not in position to grant an increase in pay without first finding some way of increasing its revenue The plan is to divide the increased earnings on a fifty-fifty basis with the men. In other words, it is estimated that the increased revenue resulting from the elimination of these tickets will be sufficient to give the men a substantial increase in wages and to just eliminate the company's monthly deficit.

Personal Mention

D. E. Parsons Elected

General Manager of East St. Louis Lines, Made President of the Illinois Electric Railway Association

D. E. Parsons, elected president of the Illinois Electric Railway Association at the meeting in St. Louis, Mo., on June 20, was born at Huntington, W. Va., on Oct. 29, 1882. He received a common school education in the public schools of Huntington and was graduated from the Marshall College Preparatory School at the same place. Mr. Parsons entered West Virginia University for the degree of Bachelor of Science and was graduated in the year 1903.

In 1904 he entered the technical two-year apprenticeship course in the works of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., where at the end of two years he accepted a position in the sales department, and in 1906 was promoted to the head of the export department. In 1908 he represented the mining department in the sales organization at the branch office of the Westinghouse Company in Fairmont, W. Va.



D. E. PARSONS

In 1909 he was appointed to represent the railway and lighting department in the Pittsburgh office, handling especially public utility properties throughout eastern Ohio, northern West Virginia and western Pennsylvania. In 1916 Mr. Parsons accepted the position of general manager of the East St. Louis & Suburban Company properties at East St. Louis, Ill. These properties are under the management of the E. W. Clark & Company Management Corporation, Philadelphia, Pa. They comprise more than 100 miles of line operating in the important industrial and mining district, opposite St. Louis, Mo., embracing in addition to East St. Louis the cities and towns of Edwardsville, Collinsville Caseyville, Lebanon and O'Fallon. Included in the system are a number of important interurban electric railway lines.

Changes in Spokane

Washington Water Power Company Announces Important Changes in Its Personnel. Many Promotions from Ranks.

Numerous changes were announced on June 13 in the personnel of the Washington Water Power Company, Spokane, Wash.

V. G. Shinkle, purchasing agent, who has been associated with the company for nine years, was appointed secretary and treasurer in addition to purchasing agent. He succeeds Y. M. White as treasurer and A. F. S. Steel as secretary, both resigned.

A. C. Haggenmiller, who has been in the purchasing department for some years, was appointed assistant purchasing agent. Both Mr. Steele and Mr. White will remain with the company until all matters in connection with the change are worked out.

As an economy measure it was announced that some of the work formerly handled by the treasurer's department would be transferred to the auditor's department, particularly as to keeping consumer's accounts.

Mr. Steele has been with the company as secretary for seven years. Previous to that he was chief clerk to E. L. Brown, then general superintendent of the Great Northern Railway, now president of the Denver & Rio Grande Railroad. He is a former president of the Rotary Club of Spokane and was formerly northwest district governor of the Rotarians.

Mr. White came to the company in 1912 from Britannia, B. C. where he was secretary, treasurer and manager of stores for the Britannia Mining & Smelting company.

Other changes announced are as follows:

C. F. Uhden chief engineer, has resigned to enter private business. He has been succeeded by J. B. Fisken, who was superintendent of the light and power department of the company.

V. H. Greisser, who was assistant engineer, has been made consulting engineer to report to the general manager.

D. F. Henderson, has been appointed superintendent of distribution.

B. M. Merrill has been appointed superintendent of power. He was assistant superintendent in this department.

M. W. Birkett has been appointed assistant to the general manager.

W. B. Rounsavell has been appointed custodian of the building.

S. E. Waters, custodian of the building, has been assigned to other duties.

The resignation of C. S. McCalla as vice-president and general manager of the company was noted in the ELECTRIC RAILWAY JOURNAL for May 4.

J. H. Van Brunt Elected

General Manager of St. Joseph Lines Made President of the Missouri Association of Public Utilities

J. H. Van Brunt, vice-president and general manager of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., was elected president of the Missouri Association of Public Utilities at its recent annual meeting. Mr. Van Brunt began his business career with the banking house of R. B. Newcombe & Company, New York, N. Y., in 1885. In 1889 when Newcombe & Company and the other interests purchased the St. Joseph company, Mr. Van Brunt was sent to St. Joseph to take charge of the receipts. He has been identified with the St. Joseph company in different capacities continuously since that time. In 1902 he was elected vice-president and general manager of the company.



J. H. VAN BRUNT

George Williams has been elected a director of the Cities Service Company, New York, N. Y., succeeding John C. Mitchell, Denver, whose Federal Reserve Bank duties prevented attendance at many directorate meetings.

D. L. Fennell has been appointed assistant superintendent of transportation of the Kansas City (Mo.) Railways. Mr. Fennell has been in the service of the railway for the last fourteen years, eight years of which time he has been engaged in work pertaining to the conducting of transportation. At the time of his appointment as assistant superintendent of transportation Mr. Fennell was superintendent of traffic for the company.

H. H. Oellig, master mechanic of the Petaluma & Santa Rosa Railway, Petaluma, Ca., has resigned to accept the position of California State manager of the American Guaranty Company,

Pittsburgh, Pa. Mr. Oellig began his railroad career with the Market Street Railway, San Francisco, Cal., and contined with that company and its successors, the United Railroads, San Francisco, until August, 1906, when he resigned as dispatcher to become master mechanic of the Petaluma & Santa Rosa Railway.

A. M. Fisher has been appointed by the board of directors of the Washington Railway & Electric Company, Washington, D. C., to succeed the late C. E. Brown as treasurer of the company. For the last fifteen years Mr. Fisher has been connected with the General Electric Company in an official capacity, with the treasurer's office both at Schenectady and New York city and has had a wide experience in accounting and financial matters involving large transactions.

Henderson W. Knott has been appointed by the United States Fuel Administration to manage the field force of engineers and inspectors which is at work among the 250,000 power plants of the country carrying out a campaign of instruction and inspection designed to bring the use of fuel for the production of power to the highest possible efficiency and economy. Mr. Knott has been the general manager of the Morgan Crucible Company of New York City. He is well known in the electric railway field.

Theodore H. Price, editor of *Commerce and Finance,* has severed his connections with that paper to accept an appointment under Director General of Railroads McAdoo as actuary of the United States Railroad Administration. Mr. Price will compile statistics and make reports concerning the various economic problems connected with the functions of the Railroad Administration. This work will require his presence in Washington a large part of the time and will prevent him from writing unofficially for publication.

Max Thelen has resigned as president of the California Railroad Commission to become supervisor of war contracts under Quartermaster General Goethals. He will act in co-operation with assistant Secretary of War Stettinius. Mr. Thelen is thirty-eight years old. He has been a member of the California Commission since he was thirty-one years old and its president for the last three years. He is a graduate of the University of California and of Harvard Law College. He was lecturer on international law at the University of California before taking up Railroad Commission work.

A. T. Van Diense has been chosen vice-president and general manager of the Columbus, Delaware & Marion Electric Company, Marion, Ohio, the successor to the Columbus, Delaware & Marion Railway. Eli M. West, who has managed the road for nine years, remains as president. Mr. Van Diense will make his headquarters in Columbus. He was formerly general manager of the Springfield Gas & Electric Company and the Springfield (Mo.) Traction Company. He was graduated from Purdue University and was connected with the Westinghouse Electric & Manufacturing Company before entering the public utility field.

A. B. Metcalfe has resigned as master mechanic of the Empire State Railroad and the Auburn & Syracuse Electric Railroad to enter the machinery and supply business under the firm name of the Reliable Supply Company, at Syracuse, N. Y. Mr. Metcalfe has been connected with street and electric railway work for the last twenty-seven years. He started in Scranton in 1891. In 1893 he became connected with the Brooklyn Rapid Transit Company. He remained with that company, for thirteen years, finally becoming assistant master mechanic. He left Brooklyn to become master mechanic with the Rochester, Syracuse & Eastern Railroad in 1906. In 1908 he accepted a position with the S. T. Baker Oil Company in its mechanical expert department. He continued in this position for a year. In 1909 Mr. Metcalfe became master mechanic of the Syracuse, Lake Shore & Northern Railroad, later known as the Empire United Railways. When the Empire United Railways was reorganized as the Empire State Railroad he was appointed master mechanic of the entire system, cluding the Auburn & Syracuse line.

Edward G. Buckland, New Haven, was elected president of the New York, New Haven & Hartford Railroad on June 25. For twenty-five years and more Mr. Buckland has been connected with the New Haven Railroad. Formerly he was assistant professor of law at Yale University, of which he is a graduate. Later on he was local attorney for the company at New Haven and still later Mr. Buckland gave up the general practice of law at New Haven and became attorney for the company at Providence for its Rhode Island affairs. In 1894 Mr. Buckland became attorney for the company and had charge of its affairs in Connecticut, Rhode Island and New York. In 1906 Mr. Buckland was elected vice-president in charge of the company's interests in Rhode Island, including the electric railways there, and was its representative in Washington. In 1910, when he returned to New Haven he was in charge of the company's Connecticut affairs, including the electric railways and the New England Steamship water lines. In 1914 Mr. Buckland was elected general counsel in addition to his vice-presidential office. His election as president of the company is a culmination of his long and active service. Mr. Buckland, as president, succeeds Edward J. Pearson, who has just been appointed federal manager of the New Haven. Howard Elliott, former president of the company and chairman of the board of directors, will remain with the company in an advisory capacity and as chairman of the committee on intercorporate relations, paying particular attention to the New Haven's non-railroad properties, especially the electric railways.

Obituary

J. L. Earley, sixty-two years old, the oldest employee of the Louisville (Ky.) Railway in point of service, died at his home recently. Mr. Earley entered the service of the company when he was eleven years of age.

P. T. Glidden, for several years manager of the Northern States Power Company, St. Paul division, died on June 18 after a lingering illness. Mr. Glidden became associated with the Byllesby interests at the time of the consolidation of the gas and electric companies of Louisville, Ky., into a single operating unit. He was born in Massachusetts in 1870. He began his business career with the Holtzer-Cabot Electric Company in Boston in 1889.

J. Lawrence Field, fifty-five years old, for the last thirty-three years identified with the Louisville (Ky.) Railway, died suddenly of apoplexy at his home, on the night of June 19. Mr. Field was a native of Louisville. He went to work for the railway as a driver of a mule car at the age of twenty-two. When the mule cars were abandoned he became a motorman. About twenty-seven years ago he entered the claim department and at the time of his death he was chief adjuster in that department.

New Publications

Fuel Economy in the Operation of Hand-Fired Power Plants

Prepared by a special committee of the research staff of the Engineering Experiment Station, University of Illinois, Urbana, Ill. Published by the Station as circular No. 7, for free distribution.

The Experiment Station has prepared this booklet for the purpose of showing how fuel can be saved. In compiling it the research staff has had the advice of a number of experts in the field of power generation. It demonstrates how the average small power plant can save 15 per cent of its fuel by the exercise of greater care in equipment and operation. Features of installation essential to the proper combustion of fuel are discussed, the practice to be observed in the operation of the plant is outlined, and the employment of simple devices for indicating conditions of operation is prescribed.

The Oklahoma City (Okla.) Railway feels the need of increased revenue. As an expedient the company has under consideration the matter of charging 2 cents for each transfer. The company operates 141 miles of line.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporation

Minneapolis, Northfield & Southern Railway, Minneapolis, Minn.—Articles of incorporation have been drawn for the Minneapolis, Northfield & Southern Railway, which will be the corporate title of the reorganized Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company. The new company is to be capitalized at $500,000, with 5000 shares of $100 par value.

Franchises

East Cleveland, Ohio.—By a vote of 1006 to 189 the electors of East Cleveland approved the franchise recently granted the Cleveland Railway by the City Commissioners. It covers a term of twenty-five years and calls for a 5-cent fare, with provision for a readjustment every five years. The schedule will be about what is at present furnished.

Burlington, Vt.—The franchise of the Burlington Traction Company, especially that part which relates to North Street, from Winooski Avenue to North Avenue and North Avenue from North Street to the Institute Road will be amended in the near future.

Track and Roadway

***Grass Valley, Cal.**—The Empire Mines Company is building an electric railway from the Pennsylvania mine to the Empire mill.

Hammond, Whiting & East Chicago Railway, Chicago, Ill.—The Public Service Commission of Indiana has ordered the Hammond, Whiting & East Chicago Railway to construct side or passing tracks in sufficient size to meet all requirements between the Michigan Central tracks and the Indiana Harbor Railway crossing and the Calumet River bridge on Calumet Avenue; also between Carroll Street and Williams Street on South Hohman Street.

Fort Madison, Ia.—Plans are being made by C. W. Petsch and H. S. Payne, promoters of the proposed electric railway between Fort Madison and Nauvoo, for the construction of the line this year. (Apr. 27, '18.)

Independence & Sugar Creek Railway, Independence, Kan.—The projectors of the proposed electric railway from Independence to Sugar Creek have named it the Independence & Sugar Creek Railway and have decided to incorporate it under that name. Committees have been appointed to solicit subscriptions for the balance of the $50,000 necessary to build the road, a part already having been subscribed. The Kansas City Railways has agreed to build and operate the road as a part of its system, connecting in Independence with the north end of the cross-town line.

Joplin & Pittsburg Railroad, Pittsburg, Kan.—About 45 miles of railway will be built by the Joplin & Pittsburg Railroad at Pittsburg, Columbus and Miami at a cost of about $400,000. The plans include the construction of a carhouse, power plants, etc., and involves 45 miles of wooden poles, transmission line, trackage, etc.

Scottsbluff, Gering & Southern Railway, Scottsbluff, Neb.—Washington Aldridge, Omaha, has been appointed manager of the Scottsbluff, Gering & Southern Railway, which proposes to construct a line to connect Scottsbluff and Gering. [May 11, '18.]

Ohio Electric Railway, Springfield, Ohio.—Work will soon be begun by the Ohio Electric Railway on the construction of a new bridge over the Scioto River at Town Street. It will be placed just south of the present Town Street bridge, which is soon to be replaced by a new span.

Darby, Pa.—A contract to construct a second track along the Chester Pike, between Darby and Eddystone, a distance of 6 miles, has been awarded by the United States Shipping Board Emergency Fleet Corporation to MacArthur Brothers, New York. The work is to be completed in two months. The line is to provide transportation to the shipyards and munition plants south of Philadelphia, including Chester, and will be operated in conjunction with the existing single track of the Southern Pennsylvania Traction Company. The cost is estimated at $1,000,000. An item in regard to the construction of this line was published in the issue of the ELECTRIC RAILWAY JOURNAL for June 22, page 1202.

Seattle (Wash.) Municipal Street Railway—Bids will be received by William D. Freeman, purchasing agent of the City of Seattle, until July 5 for furnishing the following material for the Seattle Municipal Street Railway: galvanized guy wire, copper trolley wire, rail bonds, welding flux wire, trolley suspensions, ears and frogs.

Ohio Valley Electric Railway, Huntington, W. Va.—Application has been made by the Ohio Valley Electric Railway to the City Commissioners of Huntington for permission to postpone the construction of its Eleventh Avenue line until twelve months after the war ends. This request is made, according to representatives of the company, in accordance with the suggestion made in a bulletin issued by the American Electric Railway Association War Board that the government opposes all new undertakings in cities, counties and states unless the object and purpose is connected in some manner with winning the war. The company finds it impossible to secure steel rails, copper wire and additional cars. The company also states that no funds are available with which to defray the cost of extension and it cannot sell bonds.

Shops and Buildings

United Railways of St. Louis, St. Louis, Mo.—Fire recently destroyed a section of the carhouse of the United Railways of St. Louis, at Delmar Boulevard and DeBalivere Avenue, together with thirty-two cars. The loss is estimated at $300,000.

Houston, Richmond & Western Traction Company, Houston, Tex.—Property has been purchased by the Houston, Richmond & Western Traction Company at the corner of Texas Avenue and Louisiana Street, Houston, for the construction of a terminal. Ed Kennedy, Houston, president.

Power Houses and Substations

Union Street Railway, New Bedford, Mass.—The Public Service Commission of Massachusettes has authorized the Union Street Railway to issue $812,000 of new capital stock, the proceeds to be used in paying for a new power house and carhouse.

Kansas City (Mo.) Railways.—The general contract for the construction of substation No. 2 at 101 Oak Street has been awarded by the Kansas City Railways to L. Breitag & Son Construction Company, Kansas City. The proposed building will be 82 ft. x 48 ft., and will cost about $25,000. Contracts for electric wiring, heating, plumbing, etc., will soon be awarded.

Public Service Railway, Newark, N. J.—Plans have been prepared by the Public Service Railway for the construction of a one-story plant, about 50 ft. x 162 ft. in size, at Bloomfield Avenue and Lake Street.

Seattle (Wash.) Municipal Railway.—Specifications have been approved by the Board of Public Works for a 1000-kw. motor generator set for the proposed elevated line of the Seattle Municipal Railway.

Washington Water Power Company, Spokane, Wash.—Plans are being made by the Washington Water Power Company to take over the electric plant in La Crosse and to extend its line from Endicott to La Crosse.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Nearly 100 per Cent Advances in Three Years

Western Railway Submits List of Increased Cost for Equipment and Materials.

In commenting upon the necessity of increased revenues for electric railways. The *Railwayman,* published by the Kansas City (Mo.) Railways, says: "During the past two years there has been an ever-widening gulf between the cost of service and the prices received from the people." Emphasizing the increased cost of equipment, rolling stock and other materials the Kansas company furnishes the following figures, showing the advances made in the price on items in every-day use between 1915 and 1918:

Article	1915	1918
Street cars (each)	$6,000.00	$8,000.00
Steel rails (ton)	36.50	52.50
Ties (each)	.53	.78
Spikes (cwt.)	1.58	3.05
Trolley wheels (each)	1.10	1.85
Trolley poles (each)	1.75	3.05
Steel street poles (5 in. x 30 ft.) (each)	25.75	41.50
Electric switches (approximately 140 in service) (each)	160.00	180.00
Paint (gallon)	1.15	2.00
Boiler tubes (50 boilers, 280 tubes each) (each)	4.60	18.00
Steel sheets (cwt.)	3.50	7.00
Steel bars (cwt.)	1.67	4.50
Cement (30,000 bbls. annually) (bbl.)	.80	2.00
Crushed rock (cubic yard)	.85	1.35
Trolley wire (½ lb. per foot) (lb.)	.13	.38
Lumber (M ft.)	25.00	35.00

As compared with current prices the foregoing, in not a few instances, is much below the market. Rails are higher, so are cars, trolley wire, cement and a number of other articles.

Revised Prices on a Higher Level Announced

Car Heaters and Other Articles in the List—Brisk Demand for Fare Boxes

Some time ago an advance of 15 per cent was made on its products by the Gold Car Heating & Lighting Company. Another increase of 25 per cent was announced a few weeks ago, and a still further mark up to 15 per cent may occur later on. The latest revision represents only the second change within a year, occasioned by the increasing cost of production.

Cement of which one traction road alone used 25,000 lb. in a year, went up 8 cents a barrel on Tuesday of this week, with the exception of the New York City territory.

Large size motors from 150 hp. up have not improved on delivery. Their cost and shipment depends upon factory conditions, which at present are very much congested.

While a manufacturer of car curtain goods and headlinings has not changed his prices recently, a rule that quotations will be withdrawn in thirty or sixty days, according to the standing of the buyer, is followed. The customer is protected during this period should a higher price prevail. If an increase is announced in advance, no concern is permitted to "load up" with the firm's specialties.

Inquiries for fare boxes are coming in as rapidly as the railways are accorded the 6-cent and 7-cent fares. The outlook for a brisk demand for these goods is promising.

Record Amount of Bituminous Coal Mined Last Week

Shortage in Quantity of Anthracite Produced—Labor Situation Cause for Deep Concern

During the week ending June 15 production of bituminous coal equaled and even exceeded the record production of the week preceding. The output of soft coal (including lignite and coal made into coke) is estimated at 12,571,000 net tons, an increase over the week of June 8 of 170,000 net tons or 1.4 per cent, and over the current week of 1917 of 1,137,000 net tons or 10 per cent. According to the figures furnished by the United States Geological Survey, the large gain in production is attributed to both improved supply of coal cars and labor conditions.

Shortage of labor and the new draft, next week, threatens to cut down by 1,500,000 tons the production of anthracite this year, the output of the Delaware & Hudson Coal Company. Such loss in tonnage under existing conditions is serious. It illustrates similar straightened conditions with all the mines in the anthracite region.

Shipments of anthracite last month fell 30,000 tons under the total for the same month in 1917. Labor shortage makes the explanation.

The current orders for coal far outran the production, as they have been doing right along, so that there existed the strongest business reason for the industry to get out a maximum of anthracite. This was done to the extent possible with every effort put forward to stimulate production. All that could be done under the circumstances was to get out for market an average of 265,000 tons for each of the twenty-six working days, the total for last month being 6,887,000 tons shipped.

Cost of Railway Material Gone Up 110 per Cent

Further Advance of 15 per Cent Predicted on Entire Line—Opinions on Steel Supply Varies

Opinions are at variance over the supply of material for the manufacturer of electric cars, accessories, fittings, and furnishings. The only increase in price made by the War Industries Board, and approved by the President on June 22, was 45 cents a ton on iron ore.

The price on finished steel, f.o.b. Pittsburgh, and all other maximum prices now prevailing, are continued in effect from July 1 to Sept. 30. The schedule was maintained despite the arguments for an increase in view of the advance in freights in effect on June 25, and costs.

A selling agent for gears and pinions, in stating that a number of traction roads had booked their requirements for 1919 on a generous basis, said that since the government had taken over the control of steel and iron the market was easier for material. He further believed the trade's required quota would be fully satisfied in due course. Under the circumstances the manufacturer felt justified in making definite arrangements for delivery. Price, however, on the orders for gears and pinions referred to will not be quoted until the date of shipment.

With a manufacturer of heaters and ventilators a different view was taken. While having in stock a fair supply of material its scarcity could not be questioned. He felt uneasy over the future, the danger of a shortage was real beyond a doubt. The statement was also made that there has been an advance of 110 per cent—some articles very much higher—on railway equipment and accessories since the pre-war period. A further advance of at least 15 per cent was predicted on the entire line.

Being in class B of the preferential list, a manufacturer of track specialties declared that for certain purposes steel would be furnished by the mills. For electric railway material this supply would be uncertain and distributed by the mills after all government requirements had been met and under the regulations prescribed by the War Industries Board. In about six months, however, conditions would be greatly improved.

The opinion generally expressed is that the demand for and sale of railway goods would materially increase and business become brighter and better in the not distant future.

Alloy Steel Eliminated in Car Axles and Gearing

Reported Action of Government Disputed—Requirements for 1919 Appearing—Promises Declined

About this time the traction roads which look ahead and provide for their requirements in car axles, wheels, springs, gears and pinions are in the market for the 1919 supply. So far no outstanding orders have been placed on account of the peculiar conditions, but inquiries are frequent, and requests for quotations, deliveries and specifications are coming into the mills, manufacturers and sales agents.

Being so far ahead, in time, no one is making any definite quotations as far as can be ascertained, or promise of shipment. Acceptances and deliveries at the convenience of the mills, it is learned, are the only terms offered. The foundries say it is impossible to act otherwise, as no one can foretell with any degree of certainty what may occur between now and 1919. Price is generally regarded as secondary. Delivery is the primary consideration. Old and steady customers are given the preference on orders and the selling figures are arranged accordingly.

It is also reported that the government has requisitioned the entire output of ferro-manganese in every form for the production of munitions, certain parts of aeroplanes and other purposes. Some axles and gears for electric cars are made of chrome steel, and one concern doing an extensive business in this line has been instructed by its foundry to notify prospective buyers that alloy steel will be eliminated in that particular company's production. High-tension steel of the required test strength will be substituted.

Careful inquiry has failed to find more than one other mill having heard anything whatever of the government's attitude toward alloy steel referred to above. In fact, several of the largest factors in the line state they had no knowledge of such an order. They admit steel in any form is hard to get, but in a couple of months after the mills have been speeded up all the government's requirements will be met, and there will be an ample supply for commercial consumers. These firms aver malleable iron is in shorter supply than steel. Prices now current on the official schedule, while officially arranged on a three-month basis, are freely predicted to stand for the next six months.

Further Installations of Combination Wood and Steel Tie

The Standard Steel Tie Company, Dallas, Tex., whose combination steel and wood tie was described in the ELECTRIC RAILWAY JOURNAL of March 16, 1918, recently received orders for 100 ties each from the Northern Texas Traction Company for installation on the Dallas-Fort Worth interurban between the end of the Boundary Street car line in Dallas and Merifield station; 100 ties for the Texas Electric Company for installation between Oak Cliff and Morris, and 100 ties for the Dallas Railway on the Fair Park and Second Avenue lines.

This tie company recently made inquiry of the Pittsburgh Railways, the Pennsylvania Railroad and the New York Central Railroad concerning the behavior of experimental sections placed in 1914. Satisfactory replies were received from all the users.

Publicity Man Promoted

A. B. Cole Becomes Assistant Manager of Publicity of Westinghouse Electric & Manufacturing Company

A. B. Cole has been appointed assistant to manager, department of publicity, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., to succeed M. C. Turpin, who has accepted a position in the Ordnance Department at Washington, D. C. Mr. Cole will have charge of the editorial work, including the preparation of literature and supplying information to the press.

He started his career as general carshop laborer for the Grand Rapids, Grand Haven & Muskegon Railway, with the idea of obtaining a first-hand working knowledge of electric railway operation. In June, 1909, he graduated from the School of Electrical Engineering, Purdue University, where he made a specialty of steam and electric railway studies.

On July 15, 1909, he entered the engineering apprenticeship course of the Westinghouse Electric & Manufacturing Company and completed this work on Feb. 6, 1911. While on the course he was engaged, in addition to the regular shop testing, on railway project work in the general engineering division and as a railway sales correspondent at East Pittsburgh and afterward in the Cincinnati district office.

In November, 1912, Mr. Cole was transferred to the department of publicity to prepare railway publications and a year later was placed in charge of railway and large power apparatus publicity. Later he was appointed in charge of railway, power, marine and R. D. Nuttall Company publicity, a position which he has held until the time of his appointment as assistant to manager.

Recently Mr. Cole has been co-operating on publicity matters with the American Electric Railway War Board at Washington, D. C., spending one-half of his time in Washington and the remainder in East Pittsburgh.

The Westinghouse Electric & Manufacturing Company a few months ago delegated Mr. Cole to make a general freight survey of a large number of the electric railways of Indiana, Ohio, Michigan, Illinois, Wisconsin and Iowa to determine what possibilities existed for a more extensive use of transportation facilities for hauling freight, relieving the steam road congestion, and thus helping win the war. The results of this investigation appeared in the issue of this paper for May 11, coordinated with data secured by the American Electric Railway War Board. It attracted wide attention and has been reprinted in pamphlet form.

Rolling Stock

International Railway, Buffalo, N. Y., had one of its electric locomotives destroyed by fire on the Lockport & Olcott division.

Monongahela Valley Traction Company, Charleston, W. Va., has been authorized to purchase ten double-truck passenger cars by its board of directors. At the same meeting the regular dividend of the company was declared.

United Railways, St. Louis, Mo., on June 14 is reported to have had thirty-one cars and a snow sweeper destroyed by fire. The carhouse where the rolling stock was stored was also seriously damaged. The loss is estimated at $200,000 to $250,000.

Pittsburg County Railway Company, McAlester, Okla., has just received two new all-steel cars from St. Louis, Mo., and four others have been ordered and will be received soon. The new cars will be put in service on the lines in McAlester and between North and South McAlester.

Charleston Consolidated Railway & Lighting Company, Charleston, S. C., as noted in the ELECTRIC RAILWAY JOURNAL of May 18, has placed an order for ten single-truck and sixteen double-truck cars with the Cincinnati Car Company for delivery in August. The following are the specifications for the single-truck type:

Number of cars ordered	10
Date of delivery	August
Builder of car body	Cincinnati Car Co.
Type of car	Single-truck one-man
Seating capacity	32
Weight (total)	13,000 lb.
Length over bumpers	27 ft. 9½ in.
Width over all	8 ft. 3 in.
Body	All steel
Interior trim	Cherry
Headlining	Carline finish
Roof	Arch
Air brakes	Safety Car Devices Co.
Axles	Laclede Steel Co.
Bumpers	Channel
Conduits and junction boxes	Duraduct
Control, type	K-10
Couplers	Bar type
Curtain fixtures	Curtain Supply Co. No. 88 Ring
Curtain material	Pantasote
Designation signs	Keystone
Door operating mechanism	Safety Car Devices Co.
Fare boxes	Johnson
Fenders or wheelguards	Company's standard
Gears and pinions	Nuttall
Hand brakes	Cincinnati drop handles
Heaters	Consolidated
Headlights	Golden Glow
Journal boxes	Symington
Lightning arresters	Westinghouse
Motors, type and number	Two West. 506, inside hung
Paint, varnish or enamel	Flood & Conklin
Registers	International
Sanders	Safety Car Devices Co.
Sash fixtures	Cincinnati
Seats, style	Hale & Kilburn
Seating material	Rattan
Step treads	Fernlun
Trolley catchers or retrievers	Ideal catchers
Trolley base	U. S. No. 14
Trolley wheels or shoes	U. S.
Trucks, type	Cincinnati
Ventilators	Utility
Wheels (type and size)	C. I. 24 in.

Trade Notes

Railway Improvement Company, New York, N. Y., advises that it has received an additional order for fourteen Rico coasting recorders from the Havana (Cuba) Central Railroad. The recorders are to be used on the lines of the United Railway of Havana.

Pittsburgh Crane & Equipment Company, Pittsburgh, Pa., has placed the selling agency of its electric overhead traveling cranes, wall-type jib and hand power cranes for the metropolitan district with John H. Barker, 95 Liberty Street, New York, N. Y.

Electric Service Supplies Company, Philadelphia, Pa., reports that, measured in volume, its railway and central station business is practically the same as last year, while on a percentage basis this business is only one-half of its total as against three-fourths in the pre-war period. This is due to the extension of the company's business into other lines resulting in large business from various industries such as mines, industrial plants, shipyards, government activities, etc.

The Arthur Power-Saving Recorder Company, New Haven, Conn., reports, as an indication of the widespread interest in fuel conservation which exists throughout the world to-day, that during the past few weeks orders for power-saving recorders have been received from Australia, New Zealand, the Philippine Islands, and in addition, eight orders from six states of the Union.

General Electric Company, Schenectady, N. Y., has supplied three 1000-kw. rotary converters, with transformers, to the Public Service Railway for its three substations in Camden, N. J. This is additional equipment for the company's power plants in that place. The New York Central Railroad will order a 22,000-kw. turbine for its Yonkers, N. Y., power house from the General Electric Company when the requisition for this equipment is indorsed by the United States Railroad Administration.

Tool Steel Gear & Pinion Company, Cincinnati, Ohio, reports that through its Chicago representatives, the Hegeman-Castle Corporation, it has received an order from the Chicago Surface Lines for 1060 gears and 1060 pinions. These are to be used on a ratio change for the cars operating on both the West Side and South Side. The company also reports that through its Eastern selling representatives, the National Railway Appliance Company, New York, N. Y., it has just received the order from the Brooklyn (N. Y.) Rapid Transit Company covering its entire requirements for gears and pinions for 1919 on its surface lines, subway and elevated systems. The company has had a similar order from the Interborough Rapid Transit Company for its requirements.

New Advertising Literature

Bussmann Manufacturing Company, St. Louis, Mo.: Bulletin describing and illustrating the company's fuses for all types of electric circuits.

U. S. Ball Bearing Company, Chicago, Ill.: Data sheets compiled to furnish in a convenient form essential information regarding the dimensions of all types of Strom bearings.

Mitchell-Rand Manufacturing Company, New York, N. Y.: Card to which is attached a sample of "Tuftex" red-rope paper for use in armature slots and various other places in generators and motors.

U. S. Ball Bearing Manufacturing Company, Chicago, Ill.: Data sheets of information regarding dimensions of all types of Strom bearings, engineering data and other information of interest are also included in this catalog.

New Departure Manufacturing Company, Bristol, Conn.: First edition of the "New Departure Ball Bearing Manual," which is a practical guide for users of ball bearings. This is a complete and concise treatise on ball bearings, and discusses the best installation practice and also improved methods of lubrication and adjustments. It includes full descriptions and dimensions of the "New Departure" double-row and single-row "Radax" magneto ball bearings.

NEW YORK METAL MARKET PRICES

	June 19	June 26
Copper, ingots, cents per lb	23¼	23¼
Copper wirebase, cents per lb	26½	26½
Lead, cents per lb	7.235	.8
Nickel, cents per lb	40	40
Spelter, cents per lb	8	8.62½
Tin, Chinese*, cents per lb	90	925
Aluminum, 98 to 99 per cent., cents per lb	†33.00	†33.00

* Nominal. † Government price in 50-ton lots or more, f. o. b. plant.

OLD METAL PRICES—NEW YORK

	June 19	June 26
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	19	19
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6¼	6¼
Zinc, cents per lb	5¼	5¼
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton	$16.00	$16.25

ELECTRIC RAILWAY MATERIAL PRICES

	June 19	June 26
Rubber-covered wire base, New York, cents per lb	27 to 30	27 to 30
Weatherproof wire (100 lb. lots), cents per lb., New York	35 to 37.10	32½ to 37.10
Weatherproof wire (100 lb. lots), cents per lb., Chicago	35.42 to 38.35	35.00 to 35.43
T rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T rails (A. S. C. E. standard), 100 to 500 ton lots, per gross ton	$67.50	$67.50
T rails (A. S. C. E. standard), 500 ton lots, per gross tons	$62.50	$62.50
T rail, high (Shanghair), cents per lb	4½	4½
Rails, girder (grooved, cents per lb	4½	4½
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3½	*3½
Tie plates (brace type), cents per lb	*3½	*3½
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3½	*3½
Angle plates, cents per lb	*3½	*3½
Angle bars, cents per lb	*3½	*3½
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount	80%	80%
Car window glass (single strength, first three bracketl, B quality), New York, discount	80%	80%
Car window glass (double strength, all sizes AA quality), New York discount	82 & 3%	82 & 3%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13½	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.50	$38.50
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.50	$42.50
Asphalt filler, per ton	$45.00	$45.00
Cement (carload lots), New York, per bbl	$3.20	$3.20
Cement (carload lots), Chicago, per bbl	$3.26	$3.34
Cement (carload lots), Seattle, per bbl	$3.60	$3.68
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.60
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.58	$1.60
White lead (100 lb. keg), New York, cents per lb	10	10½
Turpentine (bbl. lots), New York, cents per gal	42½	70

* Government price.



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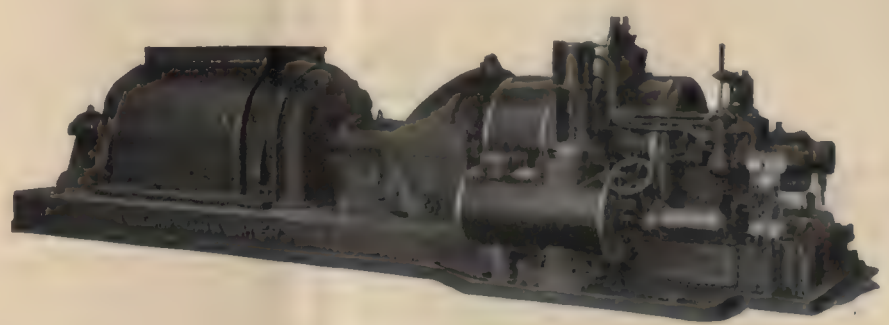
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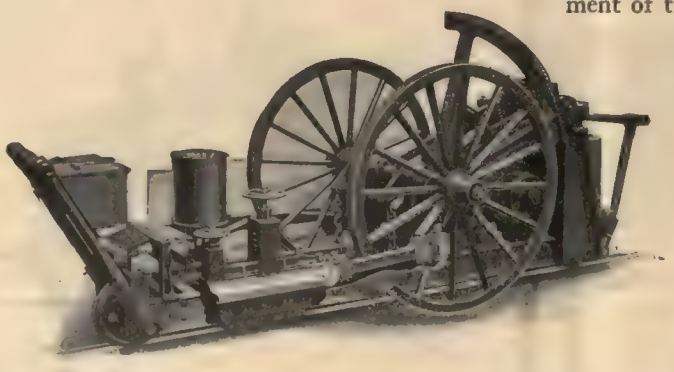
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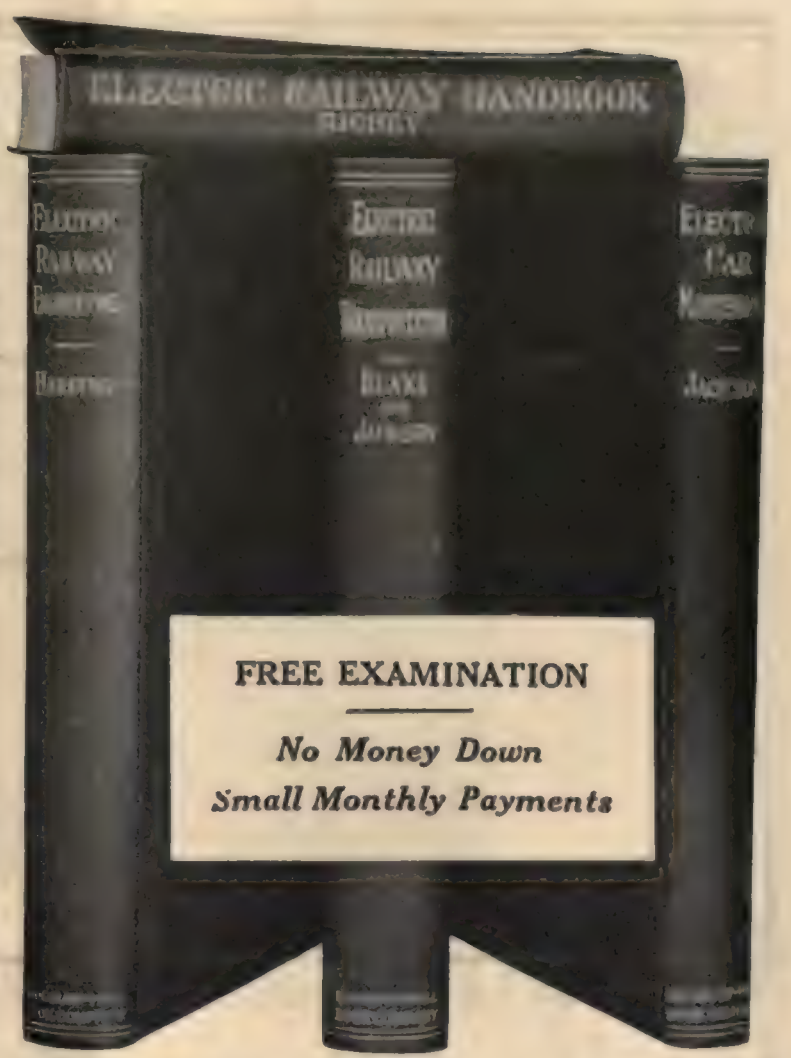
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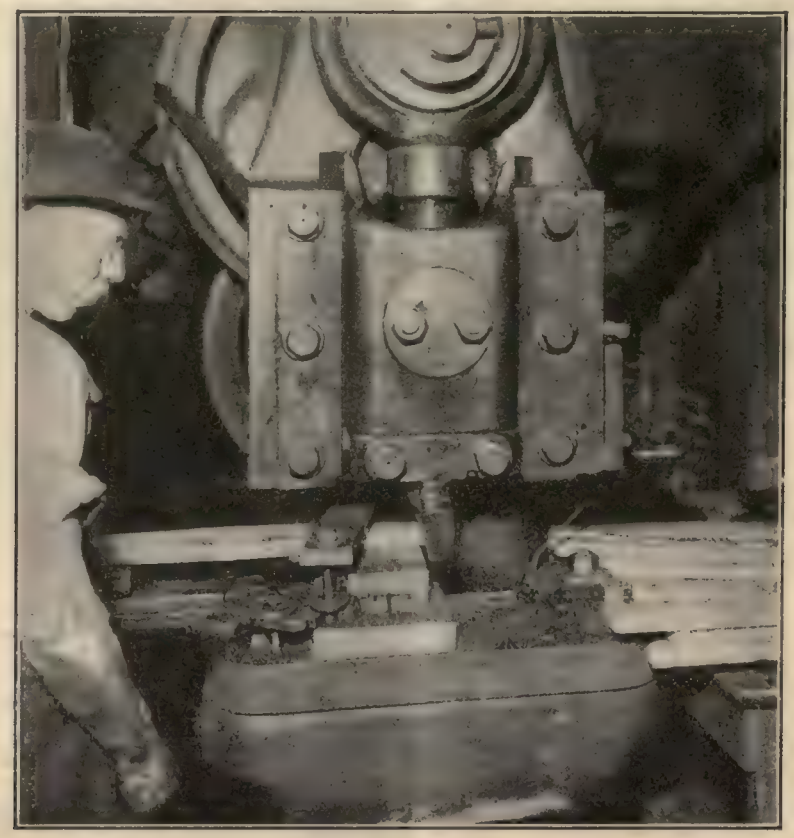
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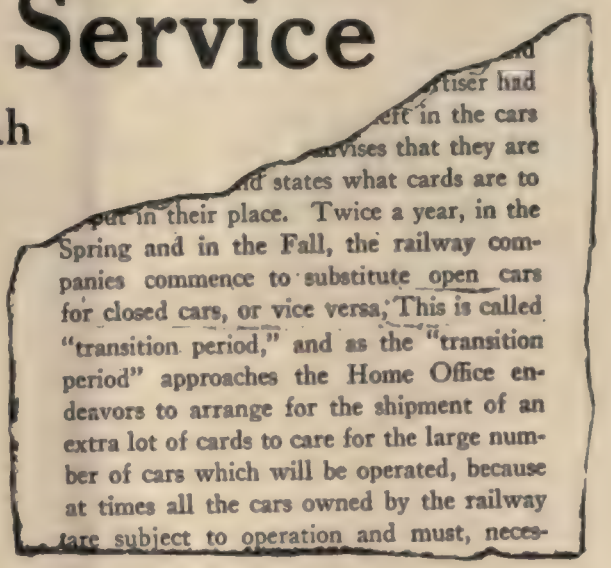
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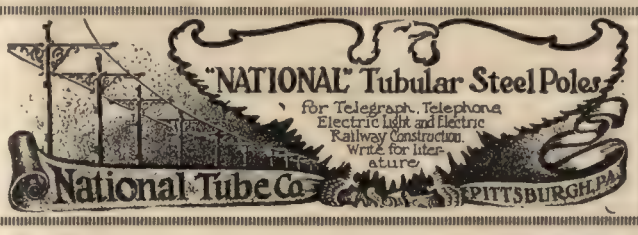
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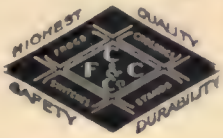
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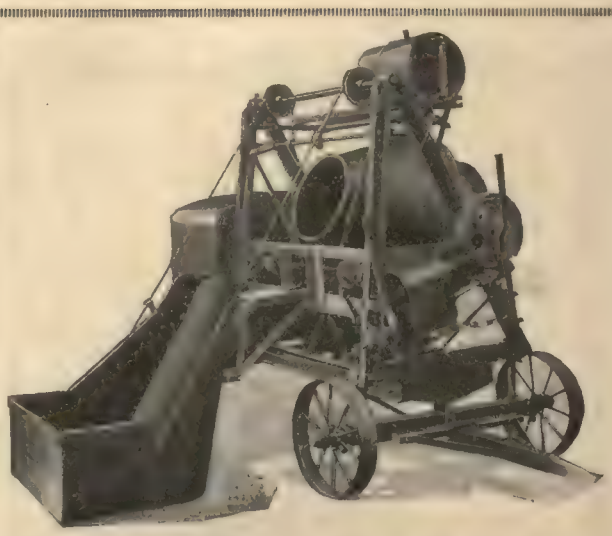
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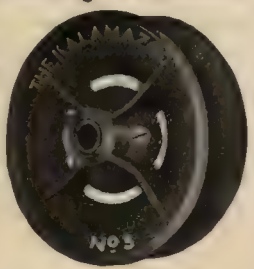
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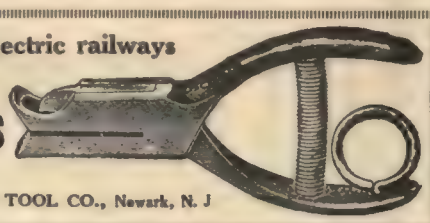
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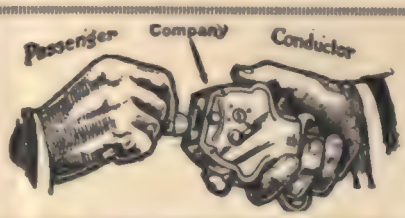
RAILWAY UTILITY COMPANY

Sole Manufacturers
"HONEYCOMB" AND "ROUND JET" VENTILATORS for Monitor and Arch Roof Cars, and all classes of buildings; also ELECTRIC THERMOMETER CONTROL of Car Temperatures.
141-151 WEST 22D ST. Chicago, Ill. *Write for Catalogue* 1328 BROADWAY New York, N. Y.

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Show origin and destination of every fare collected as well as other valuable traffic data.

The Bonham Recorder Co., Hamilton, O.



Direct Automatic Registration By the Passenger
Rooke Automatic Register Co.
Providence, R. I.

Consolidated High Grade Products

Electric car heaters—thermostatic control—pneumatic car door operators—buzzers, single-stroke bells, starting signal lights—special resistances.

CONSOLIDATED CAR HEATING CO. Albany New York

Hot Air — Hot Water — Electric

HEATERS

Also Thermostatic Control

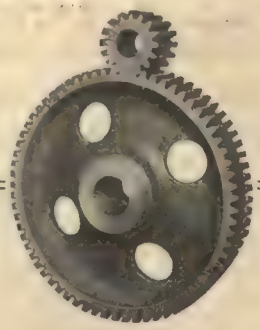
THE PETER SMITH HEATER CO., Detroit, Mich.

UNIVERSAL ANTI-SLIP TREADS

cars and station steps.

Universal Safety Tread Company
Waltham, Mass.

MASON SAFETY TREAD—Steel or carborundum filled; non-slippery; prevents accidents; cuts out damage suits.
KARBOLITH CAR FLOORING—for steel cars; is sanitary, light weight, fire proof, non-slippery.
STANWOOD STEPS—Self-cleaning, non-slippery, light.
Our products used on all leading railroads, on cars and stations. For details address
AMERICAN MASON SAFETY TREAD CO., Lowell, Mass.
Branch Offices: Boston, New York City, Philadelphia.
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Service

THE demand everywhere is for dependable service. It should be met.

Here's one way that will help. Install B P treated gearing on rolling stock, in shops or power plants and minimize breakdowns and replacements. B P will do it because it gives 4 times the life of untreated steel gearing in identical service.

The installation of B P will assist you in giving the kind of service that it is your desire to render.

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PITTSBURGH

Holden & White Inc.

Electric Railway Sales Distributors for:

Wasson Air-Retrieving Trolley Bases. (U. S.)
Garland Ventilators. Miller Trolley Shoe.
Perry-Hartman Center Plates and Side Bearings.
Watson Car Lighting Regulator.
Anderson Brake Slack Adjusters.
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Reciprocating Track Grinder.
Lincoln Rail Bonding and Bonds.
Atlantic Equipments for Joint Welding

817 Fisher Building CHICAGO

MORE-JONES

V-K

Using the V-K Oilless Trolley Wheel and V-K Non-Arcing Harp saves power and insures maximum conductivity with entire freedom from interruptions of current to the pole. It leads to improved service and longer wheel mileage.

Catalog on request.

More-Jones Brass & Metal Co.
St. Louis, Mo.

Oilless Trolley Wheel

"Boyerized" Products Reduce Maintenance

Bemis Trucks	Manganese Brake Heads
Case Hardened Brake Pins	Manganese Transom Plates
Case Hardened Bushings	Manganese Body Bushings
Case Hardened Nuts and Bolts	Bronze Axle Bearings

Bemis Pins are absolutely smooth and true in diameter. We carry 40 different sizes of case hardened pins in stock. Samples furnished. Write for full data.

Bemis Car Truck Co., Springfield, Mass.

It Pays to carry an advertisement in the ELECTRIC RAILWAY JOURNAL every issue of the year because you obtain proportionately better **Results**

UNION SPRING & MFG. CO.
SPRINGS
COIL AND ELLIPTIC
M. C. B. Pressed Steel Journal Box Lids
General Office: Fulton Bldg.
PITTSBURGH, PA.
Works: New Kensington, Pa.
50 Church St., New York. 1204 Fisher Bldg., Chicago, Ill.
Missouri Trust Bldg., St. Louis, Mo.

VAN DORN COUPLERS

are made for every condition and requirement. M. C. B. Pin and Link, Car and Air, in all sizes and types.

VAN DORN COUPLER CO.
2325 So. Paulina St., Chicago, Ill.



Samson Bell and Register Cord

Solid braided cotton, extra quality. All sizes and colors. More durable, more economical and better looking than leather or rawhide. Send for samples and full information.

SAMSON CORDAGE WORKS, BOSTON, MASS. 2

N-L INDICATING TAILLIGHTS HELP CARS MAKE BETTER TIME

Colored lights are notification to those following of the movement of the car's controller. Helps avoid rear-end accidents; avoids delays of cars behind. Used on leading railways.

THE NICHOLS-LINTERN CO.
Cleveland, Ohio, U. S. A.

PROVIDENCE FENDERS **H-B LIFE GUARDS**

The Consolidated Car Fender Co., Providence, R. I.
Manufacturers of The Providence Fender and H-B Life Guards

Wendell & MacDuffie Co., 61 Broadway, New York
General Sales Agents.

The "Hycap-Exide" Battery
for
STORAGE BATTERY STREET CARS
THE ELECTRIC STORAGE BATTERY CO
PHILADELPHIA

SEARCHLIGHT SECTION

60 Tons

7-in Girder Rails

P. S. Co. Section No. 238

HENRY LE VIS & CO.
Commercial Trust Bldg., Philadelphia, Pa.

FOR SALE

3—400-kv-a Westinghouse, oil insulated, self-cooled, out door type, single phase

TRANSFORMERS

60-cycle, 25,000-volt primary, 2300-volt secondary. Delivery after July 15, 1918.

Alabama City, Gadsden & Attalla Ry. Co.
Gadsden, Ala.

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.
We positively own these Rails and offer same in carload lots and over.
25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.
Immediate shipment guaranteed and prices very attractive.
Carload and less than carload inquiries and orders solicited.
Rails cut to length for structural purposes. Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Building, Pittsburgh, Pa.

CLEVELAND ARMATURE WORKS
Cleveland, Ohio

Everything in the Line of Repairs to Electrical Machinery

Complete Armatures, New Armatures, Rewound Armature Cores, Armature Shafts, Armature Coils, Fields and Commutators.

Established 22 Years.

RECEIVER'S SALE

of Rockland, South Thomaston and St. George Railway

STATE OF MAINE
Knox, ss. Supreme Judicial Court
In Equity

Security Trust Company
vs.
Rockland, South Thomaston & St. George Railway
and
Waldo Trust Company

Under and by virtue of decree in the above-entitled cause made on the twenty-first day of June, 1918, and filed in the office of the Clerk of Courts Knox County, Maine, the undersigned Receiver being thereunto duly authorized and directed, will receive bids in accordance with the terms and conditions of said decree, bids to be received by the Receiver at his office, 414 Main Street Rockland Maine, not later than twelve o'clock noon,

July 23, 1918

for the following property: All and singular, the real estate, buildings, road-bed, privileges tracks poles, lines wires, material, machinery equipment tools implements supplies property rights easements, appurtenances and franchises, and all contracts and choses in action belonging to said Railway.

The aforesaid premises property and franchises will be sold without valuation or appraisement. The Receiver will receive sealed bids for the property as an entirety or for any part or parcel thereof, as scheduled, with the right to reject any or all bids each bid to be accompanied by a certified check for ten per cent. (10%) of the amount of the bid. Property will be sold free from all liens and claims of every character and of every name and nature whatsoever. No bid will be received by said Receiver from any person who shall not accompany his bid with a certified check for ten per cent (10%) of the amount of the bid as a pledge and as part payment on account in case his bid is accepted. Deposits so received from unsuccessful bidders will be returned; that received from a successful bidder retained to be applied to the purchase price or forfeited in case the bid shall not be made good or the purchaser shall fail to comply with any order of Court relating to the payment for said property when and after said sale shall be confirmed; if sale not confirmed, deposit returned to bidder. Sale to be made subject to confirmation by the Court. Court reserves the right to re-sell the property in case the purchaser shall fail to make payments as required on confirmation of sale. Condition of sale more fully set forth in said decree, and title to be given in accordance therewith. All the above sold condition and completeness as is as seen and inspected and as now located. By said decree all claims to said property and liens thereon are transferred to the funds derived from said sale, and the rights of all parties making such claims are to be adjudicated in the receivership proceedings and protected in the distribution of the funds. Brief schedule will be furnished by Receiver

Dated at Rockland, Maine, June 21, 1918.

S. THAYER KIMBALL,
Receiver

Receiver's Sale of the

ST. JOSEPH VALLEY RAILWAY



25 Side dump Ballast Cars, just rebuilt, 66,000 lb. with sideboards, 24 yd.

Have new boards, bolts, posts for all 25 cars. Standard gage; 24 ft. outside overall. Inside total, 17 ft. Degree incline, 45 per cent.; over body, 22 per cent. Incline bottom, 3 ft. Flat bottom, 11 ft. Width overall, 8 ft. 10 in.; inside, 7 ft. 11 in.; rail to top, 7 ft., inside, 3 ft. Rail to top floor, 4 ft. Independent dump. Doors, 16 x 28 in. Westinghouse brakes. Steps and Grab Irons all M.C.B., standard. Four doors each side. Tower steel couplers, 5 x 5 shank. Total wheelbase, 19 ft. 4 in., 33-in. cast wheels. 9 x 11 wood bolsters. National hollow steel brake beams. 8 x 10 malleable journal boxes. Weight, 21,500 lb. Truck wheel base, 5-ft. twin full elliptic springs hung inside. 4½ x 8 journal brasses. Cars take 42 ft. radius curve, coupled M.C.B. Painted; fine condition. Cash price, $650 each.

ALSO

1—Good three-compartment **Trolley Car**, G. E. 57, 4 motors, 55 ft. long.
1—**Snow Plow**.
1—Steel underframe **Trailer**.
1—Edison-Beach **Storage Battery Car**, 8 wheels, 55 ft. long, four motors, steel underframe, modern, fine shape.
1—All steel Hall Scott **Gasoline Three-Compartment Car**, 60 ft. overall, fine shape, full swing Janney couplers; $7500. Act quickly.
15—Miles No. 9 hard drawn **Copper Phone Wire**, with porcelains and latest 50-A selective ringing Western Electric phones, with dispatchers, complete set for 15 station railway; has cabinet with more than 30 positions.
60—Miles **Copper No. 10 Gage**, with porcelains for immediate delivery, price 32c. a lb., Elkhart, Ind. Act quickly. Now selling.

Small way stations, car barns, scales, etc.

H. E. BUCKLEN, *Receiver*, Elkhart, Ind.

SEARCHLIGHT SECTION

POSITIONS VACANT

CLAIM MAN—I have an excellent all around claim man of good executive ability, capable of taking charge of claim department of average size, who must leave our climate account bronchial trouble; is on the job every minute; would like to hear from some one needing his services. P-192, Elec. Ry. Journal, Cleveland.

TWO first-class Taylor Stoker Operators wanted; $4.50 per day of 8 hours with chance of advancement and good working conditions. Apply Hampton Power Plant, Hampton, Va.

WANTED

Machine Wood Workers and Coach Carpenters

Good wages. Permanent. State experience.
MOBILE LIGHT & RAILROAD CO.
Mobile, Ala.

Rails

100 ton 7-in., 70-lb. Shanghai **Relayers.**
125 ton 9-in., 90-lb. Girder **Relayers.**
400 ton 60-lb. A.S.C.E. with angles. **New.**
100 ton 65-lb. A.S.C.E. with angles. **New.**
1000 ton 90-lb. A.R.A.-A., with angles. **New.**
200 ton 100-lb., with angles. **New.**

Full Stock, All Weights.

ZELNICKER IN ST. LOUIS
GET BULLETIN 237—70 BARGAIN PAGES.

RATES:

1 inch—$3.00
4 inches— 2.90 an inch

(The above rate applies to a 4-inch space in one issue, a 2-inch space in two issues, or a 1-inch space in four issues. The larger spaces following may be used up in a similar way.)

8 inches—$2.80 an inch
15 inches— 2.70 an inch
27 inches— 2.60 an inch
50 inches— 2.55 an inch

Rates for larger spaces furnished on application.

POSITIONS VACANT

CARBARN foreman for Forth Mile Electric Railway in Massachusetts, state experience, salary expected and when ready to report. P-193, Elec. Ry. Journal.

EXECUTIVE. Man to take charge of operations of Interurban and Street railway, by railway and light company in middle West. Familiarity with lighting business preferred on account of extension of responsibilities. P-187, Elec. Ry. Journal, Chicago.

MECHANIC to take charge of barn on small Interurban and City property wanted. Must be able to handle all barn and shop work. P-190, Elec. Ry. Journal, Cleveland.

AUDITOR and office manager for small city and suburban electric railway in growing community. Must have experience in I. C. C. Classification and be a live wire. Give full details in first letter. P-191, Elec. Ry. Journal, Cleveland.

POSITIONS VACANT

WORKING foreman for armature room wanted. Must be capable of winding all different types of street railway armatures. None but strictly sober man need apply. Please state salary expected. P-194, Elec. Ry. Journal, Philadelphia.

POSITIONS WANTED

GENERAL auditor or secretary-treasurer; 15 years' experience railroad and street railway accounting. Thoroughly conversant with Interstate Electric Railway Accounting Married; age 40. Send for record and references. PW-172, Elec. Ry. Journal, Chicago.

SUPERINTENDENT of Rolling Stock and Master Mechanic now employed in charge of 350 city and interurban cars, for satisfactory reasons seeks opportunity to make a change. Married. Thoroughly experienced and can maintain equipment at high standard. PW-189, Elec. Ry. Journal.

TRANSPORTATION—Can handle your transportation department and get results; 14 years with large street railway; thoroughly familiar with every detail of street railway transportation; best of reference from present employer; age 38. PW-181, Elec. Ry. Journal, Philadelphia.

AGENTS AND SALESMEN

Salesman Wanted

Young man with engineering training, to sell steam and street railway track work. State salary expected and all details in first letter. AS-188, Elec. Ry. Journal, Chicago.

These Pages

receive the attention of electric railway men everywhere. In every industry—in every form of electric service. Have you any proposition to put before these men? Anything to sell or buy that they may want or have? Whatever your message—

Employment or Business Opportunities Offered or Wanted :: Plants, Properties, or Used Equipment For Sale or Wanted :: Bids Wanted for Furnishing Equipment or Supplies ::

these pages—the "SEARCHLIGHT SECTION" of Electric Railway Journal will place your wants before over 8000 men. TRY THEM!

SEARCHLIGHT SECTION

Railway Motors

10—Westinghouse No. 306 Railway Motors, Type "CA" Interpole, Box Type, suitable for axles up to 5 in.

Water Tube Boilers

4—512-hp. Babcock & Wilcox, 200-lb. pressure.
2—483-hp. Heine, 200-lb. pressure.
2—480-hp. Stirling, 160-lb. pressure.
1—400-hp. Babcock & Wilcox, 160-lb. pressure.
4—360-hp. Erie City, 160-lb. pressure.
14—290-hp. Babcock & Wilcox, 160-lb. pressure.
2—283-hp. Aultman & Taylor, 160-lb. pressure.
2—283-hp. Babcock & Wilcox, 160-lb. pressure.
3—243-hp. Heine, 160-lb. pressure.
2—240-hp. Stirling, 140-lb. pressure.
3—156-hp. Heine, 160-lb. pressure.

We shall be glad to mail complete list of electrical, steam and hydraulic machinery upon request.

MacGOVERN & COMPANY, Inc.
114 Liberty St., New York, N. Y.

ROTARY CONVERTERS

1—300-kw Westinghouse Rotary Converter, 3-ph., 60-cy., 370-v. A.C., 575-v. D.C., 600 r.p.m.
3—300-kw. General Electric, 3-ph., 60-cy., 600-v., 1200 r.p.m. Rotary Converters with transformers.

TRANSFORMERS

3—750-kw. General Electric, 60-cy., O.I.S.C., 2200/4400 volts prim., 281 488 Y secy.
3—200 kv.-a. General Electric, 60-cy., air blast type, 2200 volts prim., 370 secy.
6—185-kv.-a. Westinghouse, O.I.S.C., 60-cy., 2200-v. prim., 370 secy.

ARCHER & BALDWIN, Inc.
114-118 Liberty St., New York, N.Y. Telephone 4337-4338 Rector.

FOR SALE

Immediate Delivery

CAR BODIES

1—70-ft. Steel Combination Passenger Car Body, practically new.
1—50-ft. Express Car Body, new.

MOTORS

4—Westinghouse No. 305 Motors.
4—General Electric No. 203 Motors.

McGUIRE-CUMMINGS MFG. CO.
111 West Monroe St., Chicago, Ill.

Direct Current Belted Generator

1—500-kw., 550-V., 320 r.p.m. Cp. Wd. Westinghouse 3 bearing direct current generator.

DUQUESNE Electric & Mfg Co

Write, wire or 'phone our nearest office, Pittsburgh, Pa., or 230 La Salle St., Chicago, Ill.

CAR BARGAINS

OPEN and CLOSED MOTOR and TRAIL

Write for Price and Full Particulars to

ELECTRIC EQUIPMENT Co.
601 Commonwealth Bldg Phila Pa.

Rockland, Thomaston & Camden St. Ry. Rockland, Maine. List of Material to be Sold at Power House, Rockport, Maine

BOILERS

125 hp. return tubular fire tube Boiler. A. D. Ward, Augusta, Maine. Age 25 years.

125 hp. return tubular fire tube boiler. Charles River Iron Works, Edward Kendall Sons, Cambridgeport, Mass. Age 25 years.

125 hp. return tubular fire tube boiler. A. D. Ward, Augusta, Maine. Age 25 years.

125 hp., 72 in. x 19 ft. 6 in. return tubular fire tube Boiler. Hodge Boiler Works, East Boston, Mass. Age 10 years.

CONDENSING ENGINE

1—500 hp. tandem, compound, Hamilton Corliss, with left-handed belt wheel. Built by Hooven, Owens & Reutschler, Hamilton, Ohio. Size of engine, 22 in. x 42 in. x 48 in., 70 r.p.m. Size of belt wheel, 24 in. x 48 in., with jet condenser direct connected to the main crank and feed water heater connected in the low pressure exhaust line. This unit is all complete, and in running order, belted to a line shaft with 133 ft. of 48 in. 2-ply leather belt.

SHAFTING AND PULLEYS

60 ft. of 6 in. and 6½ in.

ALTERNATOR

1—312 Kw., General Electric, 60-cycle, 2300-volt, type A.T.B., 12—312—600, form B, 78 amps. Driving pulley, 29 in. diameter by 32 in. wide, with 49 ft. of 2-ply 31 in. leather belting.

CORLISS ENGINE

1—600 hp. cross compound condensing. Built by Robert Wetherell Co., Chester, Pa. Direct connected to a 400-Kw. D.C., 550-volt, Crocker-Wheeler Ry. Generator. Size of engine, 18 in. x 36 in. x 42 in., 100 r.p.m., with a Blake steam driven jet condenser, and a feed water heater in the exhaust line. All in running condition.

OIL FILTER

1—No. 23 White Star. Filtering capacity per day, 350 gallons.

FEED PUMPS

1—7½ in. x 4½ in. x 10 in.
1—7 in. x 5 in. x 10 in.

HEATER

1—125 hp. Cochrane Feed Water. Open.

STEAM PIPE

And fittings connecting engines to boilers.

WATER TANK

1—10,000 gallon Cypress.

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in This Issue

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Air Rectifiers.
Holden & White, Inc.

Alloys, Steel & Iron
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Automobiles and Buses.
Brill Co., The J. G.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles, Car Wheel.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
National Railway Appliance Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse Elec. & M. Co.

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Badges and Buttons.
Electric Service Supplies Co.
International Register Co., The

Batteries, Dry.
Johns-Manville Co., H. W.
Nichols-Lintern Co.

Batteries, Storage.
Electric Storage Battery Co.

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More-Jones Brass & Metal Co.
St. Louis Car Co.
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Holden & White, Inc.

Bearings, Roller and Ball.
Gurney Ball-Bearing Co.
S K F Ball Bearing Co.

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Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail.
Niles-Bement-Pond Co.
Zelnicker Sup. Co., W. A.

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Babcock & Wilcox Co.

Boiler Cleaning Compounds.
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Johns-Manville Co., H. W.

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National Tube Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
American Steel & Wire Co.
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Electric Service Supplies Co.
Imperial Brass Mfg. Co.
Ohio Brass Co.

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Electric Railway Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Lincoln Bonding Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

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McGraw-Hill Book Co., Inc.

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Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

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Hubbard & Co.
Lindsley Bros. Co.
Ohio Brass Co.

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Holden & White, Inc.
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Brake Shoes.
Amer. Brake Shoe & Fdry. Co.
Barbour-Stockwell Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
St. Louis Car Co.

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Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
National Brake Co.
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American Bridge Co.

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Zelnicker Supply Co., W. A.

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Columbia M. W. & M. I. Co.
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General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
National Carbon Co.
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United States Graphite Co.

Bunkers, Coal
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Bushings, Case Hardened & Manganese
Bemis Car Truck Co.

Cables. (See Wires and Cables.)

Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc.—See those headings.)

Car Trimmings. (For Curtains, Registers, Doors, Seats, etc.—See those headings.)

Cars, Passenger, Freight, Express, etc.
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Kuhlman Car Co., G. C.
McGuire-Cummings Mfg. Co.
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More-Jones Brass & Metal Co.

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Electric Service Supplies Co.
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General Electric Co.
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Columbia M. W. & M. I. Co.
D & W Fuse Co.
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General Electric Co.
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Coin-Counting Machines.
International Register Co., The

Commutator Slotters.
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Concrete Mixers.
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Columbia M. W. & M. I. Co.
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